Instant Gratification for the Internet Generation: Goal Motivation Affects Self-Control as a Function of Self-Esteem

By

Matthew Johnston

B.Sc., with first class honours, University of Canterbury, 2016

A THESIS DISSERTATION

submitted in fulfilment of the requirements for the degree of

MASTER OF SCIENCE

Department of Psychology

College of Science

University of Canterbury

2018

Supervisors:
Dr Kyle Nash
Dr Kumar Yogeeswaran

Acknowledgements

Firstly, I would like to thank both Dr Kumar Yogeeswaran and Dr Kyle Nash for the knowledge and guidance they provided throughout this whole process. Your dedication and drive towards this project have been invaluable to me. It has been a pleasure working with both of you throughout this thesis. You make an amazing team.

I would also like to thank my family and loved ones for being so patient and understanding whilst I disappeared over the past 12 months to work on this. I deeply appreciate everything that has been sacrificed in order to help me through this project.

Lastly, I want to say a special thanks to Kirsty for her positivity and support throughout. Without you, this would not have been possible.

Table of Contents

Table of Appendices

List of Abbreviations

GIA	Goods-and-information acquisition
HSE	High self-esteem
IAT	Implicit association Test
LSE	Low self-esteem
LT	Long-term
RSES	Rosenberg self-esteem scale
SAR	Socio-affective regulation
ST	Short-term

Keywords: ego threat, emotion regulation, goal affirmation, goal conflict, goal-directed behaviour, goal motivation, Goods-and-Information Acquisition, impulsivity, response inhibition, self-control, self-esteem, self-identity, self-regulation, self-worth, Socio-Affective Regulation, state-level, trait-level

Abstract

Impulsive (low *self-control*) behaviour is linked to mental health issues (Tangney, Baumeister, & Boone, 2004), unemployment (Wright, Caspi, Moffitt, & Silva, 1999), and criminal behaviour (Gottfredson & Hirschi, 1990; Baron, 2003; Moffitt et al., 2011). Research on the causes of self-control failure can aim to ameliorate some of these societal concerns. The current study therefore set out to explore whether impulsive behaviour could be predicted through goal motivation, as moderated by self-esteem. Participants were randomly assigned to one of two conditions: (a) 15 minutes of personal social media use; or (b) 15 minutes of personal academic study, following which, all participants completed cognitive tasks as a measure of state self-control. Self-esteem was measured pre-manipulation through both *implicit* and *explicit* measures. Previous literature on social media has found its users to experience a short-term increase in *state self-esteem* (Toma, 2013). In contrast, the perception of negative academic performance causes a decrease in state self-esteem (Kernis, Brockner, & Frankel, 1989). Furthermore, this drop in state self-esteem lasts longer for individuals low in self-esteem (Metalsky, Halberstadt, & Abramson, 1987). An individual's motivation to pursue goals is determined by that individual's relationship with their environment (Ross & Nisbett, 2011). It was predicted in the current study that decreased motivation to approach, or increased motivation to avoid the pursuit of a goal, would lead to decreased self-control. As hypothesised, low implicit self-esteem individuals exhibited significantly less self-control following the performance of academic study than with social media. In contrast, high self-esteem individuals exhibited significantly less self-control following the performance of social media than with academic study.

1 Introduction

1.1 Overview and Rationale

With over 4.1 billion people worldwide now using the internet (Statista 2018), online (digital) media use is projected to overtake television use as the most time-consuming media format for US adults in 2019 (Zenith Media, 2017). The growth of the World Wide Web has "opened a new domain in social interactivity with the promise of increasing efficiency and worldwide understanding" (Nalwa & Anand, 2003, p.653). As technology continues to develop, so does our behaviour towards it. Individuals utilise online media to satisfy goals which pertain to their personal needs. According to research into uses and gratifications theory (Katz, Blumler & Gurevitch, 1973), online media use (i.e., social media) is predominantly driven by the following two motives: (a) to satisfy *socio-affective regulation*, and/or (b) for the acquisition of goods and information (*goods-and-information acquisition;* Weiser, 2001). Individuals engage in socio-affective regulation as a means of regulating emotion through immediate social gratification, that is, social media (Weiser, 2001). In contrast, individuals engage in goods-and-information acquisition in order to access and share utilitarian content online (Weiser, 2001), that is, academic material. These two categories of media usage can either affirm or conflict with an individual's goals. The purpose of the current study is to investigate how self-esteem affects an individual's goal motivation towards the consumption of different formats of media, and the subsequent affect this relationship has on state self-control.

Goals serve as the purpose and intent that drives human behaviour (Locke, 1981). The goals that an individual is motivated to pursue are a reflection of an individual's self-identity (Markus & Wurf, 1987); therefore, an individuals' self-worth is contingent upon success at these goals. The goals that an individual places the most importance on (superordinate goals)

are central to an individual's goal schema. People are motivated to perform *goal-directed behaviour* to achieve goals that satisfy their individual needs (Aarts & Dijksterhuis, 2000). Goal affirmation is the product of congruency between an individual's current behaviour within their environment and their superordinate goals. Individuals have increased motivation to engage in goal-directed behaviour which affirms these superordinate goals. Consequently, individuals exhibit optimal self-control when primed with environments that promote goal affirmation. In contrast, *goal conflict* is defined as the result of dissonance between one's actions and goals (Slocum, Cron, & Brown, 2002). Both subordinate and superordinate goals compete for use of the same personal resources (executive functions i.e. cognitive and affective processes, self-control) and intangible resources (physical and mental exertion, time). As such, individuals have decreased motivation to engage in goal-directed behaviour that conflicts with the pursuit of superordinate goals. As a result, individuals will exhibit sub-optimal self-control when placed in environments that promote goal conflict.

Self-esteem and goal motivation have a bi-directional relationship. Trait self-esteem helps determine the goals that an individual perceives themselves as capable of achieving; and state self-esteem fluctuates as a result of subsequent success or failure at these goals (Brown & Marshall, 2006). Individuals differ in their trait self-esteem levels: high self-esteem (HSE) individuals have more confidence pursuing difficult goals, whereas low self-esteem (LSE) individuals behave in a more risk-averse nature (Bandura, 1993; Baumeister, Bushman, & Campbell, 2000; Hassell & Sukalich, 2016). As such, HSE individuals pursue future-oriented or long-term (LT) goals for goods-and-information acquisition in order to satisfy their need for personal growth, whereas LSE individuals pursue present-oriented or short-term (ST) goals in order to boost and maintain their self-esteem (psychological needs) through socio-affective regulation. Goal pursuit can therefore be characterised by two distinct and divergent pathways which facilitate the performance of goal-directed behaviour.

These pathways produce fundamentally different behaviours, with one pathway facilitating implicit or impulsive behaviour, and the other facilitating explicit or controlled behaviour (Jordan et al., 2003). The current study predicts that individuals utilise controlled (high self-control) behaviour when placed in an environment that affirms their superordinate goals, due to increased motivation to engage in environments that support an individual's motives and needs. In contrast, individuals are predicted to utilise impulsive (low self-control) behaviour when primed with environments that elicit goal conflict, due to decreased motivation to engage in subordinate goals that do not support an individual's motives and needs. Goal conflict was elucidated in HSE individuals through the performance of social media, whereas academic study was utilised to elucidate goal conflict in LSE individuals. State self-control was measured through an individual's capacity to inhibit responding during self-control tasks.

1.2 The Self

Self-esteem exists as a component of the self-system (Sullivan, 1953). The self-system comprises the domains and goals specific to an individual (Sherman & Cohen, 2006). Domains include an individual's various roles, social identities, and belief systems (Sherman & Cohen, 2006). The self-system can be conceptualised as a compilation of all the different contingencies through which an individual determines their own worth (Wolfe & Crocker, 2003; Sherman & Cohen, 2006). Self-identity is formed from an individual's perception of their own self-system (Oyserman, Elmore, & Smith, 2012). People are motivated by validation from goals in domains on which their self-worth is contingent (Crocker & Park, 2004). The more central a domain is to an individual's self-identity, the more motivation an individual has to pursue goal-directed behaviour in that specific domain (Boninger, Krosnick & Berent, 1995; Steele, 1988). Goals that are central to the self therefore command priority of resources in comparison with goals less representative of the self (Locke & Latham, 2002). Furthermore, the more resources an

individual contributes to the pursuit of a goal, the more central this goal becomes to the self. Self-esteem is therefore more contingent on the success of superordinate goals than of subordinate goals (Brown & Marshall, 2006). As a consequence, goals often compete for resources, resulting in goal conflict. Goal conflict leads to sub-optimal self-control as the individual determines whether the expenditure of said resources are best reserved or expended elsewhere. It is anticipated that individuals are motivated to perform goal-directed behaviour that is congruent with their goal schema (Shah, Friedman, & Kruglanski, 2002). As such, it is predicted that HSE and LSE individuals may experience goal conflict under different conditions.

1.3 Self-Esteem

Self-esteem is defined as the degree to which people perceive themselves as capable, significant, and worthy (Gardner & Pierce, 1998). It can be viewed as both a bottom-up and top-down process. From the bottom-up perspective, self-esteem is proposed as an accumulation of micro-attributes (individual thoughts, feelings, and actions) that, when aggregated over a period of time, amount to somewhat of a running total, much like a bank account (Brown & Dutton, 1995). Boosts to state self-esteem follow from success in the discriminative domain in which the goal was accomplished (Crocker & Park, 2004). Over time, boosts or dips in state self-esteem can have an impact on trait (or *global*) self-esteem. Trait self-esteem is more constant over time than state self-esteem, which is more labile, depending on environment. From this perspective, trait self-esteem is understood as the overall evaluation of personal worth that people make and maintain with regards to themselves (Vogel, Rose, Roberts, & Eckles, 2014).

In contrast, the top-down perspective of self-esteem maintains that a view of oneself develops early in life, and once formed, influences self-evaluations and feelings of self-worth

(Brown, Dutton & Cook, 2001; Brown & Marshall, 2006; Brown & Dutton, 1995). Within this view, global self-esteem is defined as the way a person typically feels about themselves (Heatherton & Polivy, 1991; Brown & Marshall, 2006). The current research identifies with both of these perspectives and subsequently derives an adapted narrative for self-esteem, proposing that individuals take feedback received from iterations of success and failure in different domains and use that feedback to determine feelings of self-worth. In turn, individuals utilise these feelings of self-worth (self-esteem) to perform self-appraisal in regard to the goals they can successfully pursue, in order to satisfy internal needs and motives (Maslow, 1943, 1954, 1970).

Failure at goals that are linked to self-esteem results in reductions in state self-esteem, as well as increases in negative emotions such as shame, anger, and sadness (Crocker & Park, 2004). The motivational consequences of LSE come as a result of situations where self-esteem can be boosted, or threatened (Kernis, 2003). Consequently, LSE and HSE individuals pursue different goals to satisfy different needs.

1.4 Differences in Self-Esteem

Differences in self-esteem are pronounced and predicated throughout psychological literature. Individuals with HSE rate themselves as attractive, intelligent, socially skilled, outgoing, unselfish, emotionally stable, and morally sound (Heatherton & Vohs, 2000). HSE individuals appear to use better self-regulatory strategies in performance contexts (Baumeister, Campbell, Krueger, & Vohs, 2003), and generally predict higher possibilities of task success than LSE individuals (Gardner & Pierce, 1998). These individuals “commit to higher goals, engage in more difficult tasks, persevere with challenges and visualise success” (Bandura, 1993; Hassell & Sukalich, 2016). Furthermore, HSE individuals show more persistence and

self-confidence after failure than LSE individuals (Crocker & Park, 2004, Baumeister et al., 2003).

In contrast, LSE is characterised by less positive feelings towards oneself (Brown & Dutton, 1995). LSE individuals are less resilient, less optimistic (Crocker & Park, 2004), fail to cope with adversity, and devote less effort to ascertaining the skills required for successful task performance (Gardner & Pierce, 1998). In light of this previous research, the current study proposes that self-esteem is best understood as a resource. Individuals vary in the amount of this resource they possess (conceptualised as global or trait self-esteem). The amount of self-esteem an individual has, determines the goals that an individual pursues. Self-esteem in this sense is analogous to another resource, money. Both of these resources prescribe a measure of value or worth that is used to determine the opportunities available to an individual. If one individual has $10, and another other has $100, which individual is likely to be more cautious about spending $5? The worth of $5 is relative to whether you have $10 or $100, as demonstrated by the St. Petersburg paradox (Bernoulli, 1954). Similarly, the potential loss or gain of self-esteem is more valued to an LSE individual than an individual with HSE. Just as money allows individuals the luxury of pursuing expensive hobbies, self-esteem affords individuals the potential to pursue goals without a fear of failure (Brown & Marshall, 2006).

Research conducted by Steele, Spencer, & Lynch (1993) found that HSE individuals have more affirmational resources and consequently are more resilient to threatening events. In contrast, LSE individuals have fewer affirmational resources to employ when they experience ego threat, resulting in greater emotional distress (Josephs, Larrick, Steele, & Nisbett, 1992; Steele et al., 1993; Spencer, Josephs, & Steele, 1993). Consequently, LSE individuals lack confidence in themselves and as a result are more sensitive to avoiding risk (Baumeister et al., 2000). Task failure threatens LSE individuals' already-compromised levels

of esteem (Brown & Dutton, 1995). Therefore, LSE individuals are motivated to avoid failure, whereas HSE individuals are motivated to approach success (Baumeister, Tice & Hutton, 1989). Due to this disparity in self-perspective, HSE and LSE individuals perceive themselves to possess the capacity to pursue different goals in order to satisfy their respective needs.

1.5 Maslow's Hierarchy of Needs

Goals mediate the fulfilment of an array of different needs (Shah & Kruglanski, 2000; Austin & Vancouver, 1996). As per Austin and Vancouver (1996, p. 338), goals can be defined as "internal presentations of desired states". Behaviour is driven by goals, and goal-directed behaviour is motivated by sensitivity to reward or punishment (Carver & White, 1994). Needs and goals differ in their complexity and difficulty to fulfil (Shah & Kruglanski, 2000). This proposition forms the basis of Maslow's work on the hierarchy of needs and motives (1943, 1954, 1970) (refer to Appendix A, Figure 1). Maslow proposed the hierarchy of needs as a template for humankind's intrinsic motivation to seek out and achieve certain needs from their environment. Needs are structured in hierarchy of importance, where resources are primarily devoted to fundamental needs such as food, rest, and safety. Following ascertainment of these basic needs, individuals can divert resources to fulfil psychological needs such the development of friendships, intimacy, and self-esteem (McLeod, 2018). These are known as deficit needs (Maslow, 1970). The motivation to satisfy deficit needs diminishes as they are fulfilled; in other words, the need for hunger, shelter and self-esteem diminishes as it is achieved.

Following the satisfaction of these psychological needs, individuals can focus their energy, or resources towards *self-actualization* needs such as personal growth and new experiences. These are known as growth needs (Maslow, 1970). Motivation to satisfy growth needs include the pursuit of knowledge, personal development (pursuit of academic and career

success) and creative endeavours. The motivation to satisfy these needs increases as they are fulfilled (McLeod, 2018). The current study proposes that LSE individuals (self-perception of limited resources), are motivated to satisfy self-esteem needs i.e. deficit needs, whereas HSE individuals (self-perception of more abundant resources) can focus on satisfying growth needs i.e. self-actualization needs. This echoes the sentiment that LSE individuals seek self-protection, whereas HSE individuals seek self-enhancement (Baumeister, Heatherton, & Tice, 1993; Baumeister, Tice, & Hutton, 1989). An individual whose psychological needs (self-esteem) are already met (i.e., HSE individuals) is able to devote more resources to fulfilling higher-order self-actualization needs such as focusing on a career, living a meaningful life, or scholarly success. It is proposed that only once an LSE individual fulfils their psychological needs, can self-actualization needs become their prime focus. This does not mean that LSE individuals are unable to attend to higher-order needs, but this may be the cause of goal conflict due to competition for resources with superordinate goals within an LSE individual's current goal schema.

For the purposes of the current study, superordinate goals fulfil needs that are of higher importance to the individual. Environments where an individual's needs are met promote goal affirmation; environments that do not facilitate an individual's needs consequently promote goal conflict. An individual is motivated to engage in an environment that promotes goal affirmation, and disengage from environments that conflict with goals. Conflicting goals are likely to inhibit each other when they are required to compete for limited resources (Fishbach, Friedman, & Kruglanski, 2003), and, as such, goal conflict results in suboptimal performance.

1.6 Goal Difficulty

The current study divides needs into growth needs and deficit needs as per Maslow (1970). Long-term (LT) and short-term (ST) goals are terms used abstractly to denote the amount of resources required for an individual to satisfy these needs. Goal magnitude is determined by goal difficulty, amount of resources required to achieve the goal, and length of time required for successful goal pursuit. LT goals are rewarded as a function of delayed gratification. Moreover, LT goals are those that require more physical and mental exertion, take longer to accomplish, are more difficult to accomplish, and as a result, are less likely to succeed. However, LT goals are future-oriented and provide greater LT benefit. In contrast, ST goals are focused on the present and rewarded through immediate gratification.

HSE individuals are more likely to view LT goals as a way to maximise potential reward, and are therefore motivated to perform within environments that affirm such goals, as per the equation:

$$HSE \times LT\ goal = Goal\ affirmation$$

Hungarian-American psychologist Mihaly Csikszentmihalyi proposed that, due to a concept he coined as flow theory, people are compelled to engage in tasks that balance with their skill level, at the expense of diverting attention away from other tasks (Rosen, Carrier, & Cheever, 2013). Tasks that do not provide enough of a challenge to individuals can be perceived as understimulating or boring. These tasks subsequently promote disengagement (Csikszentmihalyi & Csikszentmihalyi, 1975). By pursuing ST goals that satisfy a deficit need such as the pursuit of self-esteem, HSE individuals are expending personal resources towards a need that yields no further growth or benefit, as for HSE individuals these needs have already been met. Therefore, this behaviour is summarised as:

$$HSE \times ST\ goal = goal\ conflict$$

Furthermore, tasks that are too difficult also promote disengagement, as these tasks are a cause of anxiety or threat (Nakamura & Csikszentmihalyi, 2009). As such, LSE individuals view LT goals as threatening to their ego, due to a lack of confidence in their ability to succeed. This results in goal conflict for LSE individuals, as denoted by the equation:

$$LSE \times LT\ goal = goal\ conflict$$

Instead, LSE individuals look to satisfy potential reward through the pursuit of ST goals. The probability of success is higher for the pursuit of ST goals than for LT goals. Furthermore, gratification for successful ST goal pursuit is received immediately, in comparison with the delayed gratification yielded through the successful pursuit of LT goals. As such, the pursuit of ST goals elicits goal affirmation in LSE individuals, as per the equation:

$$LSE \times ST\ goal = goal\ affirmation$$

The current study will investigate how individuals respond when primed with environments that elucidate goal conflict. I propose that goal conflict elicits impulsive responding, whereas goal affirmation elicits controlled responding. This divergent behaviour can be explained from the perspective of dual-process models. Epstein and Morling's (1995) cognitive-experiential self-theory (CEST) proposed that people have two distinct, yet interacting, psychological networks that determine human behaviour (Hofmann, Friese, & Strack, 2009; Spalding & Hardin, 1999). These dual-process models provide an account for understanding how both implicit and explicit self-esteem may influence impulsive versus controlled behaviour.

1.7 Dual-Process Models

Various dual-process models have been proposed throughout relevant literature, such as the hot–cool system (Metcalfe and Mischel, 1999), impulsive versus reflective model (RIM; Strack & Deutsch, 2004; Hoffman, Friese, & Strack, 2009), and fast/system 1 versus slow/system 2 processes (Kahneman & Egan, 2011). From the perspective of psychoanalytic theory, these pathways are viewed as a seesaw between (a) an impulse-driven, largely irrational system driven by immediate gratification and known as primary process thinking; and (b) a patient, logical, secondary process thinking system that is motivated by delayed gratification in order to attend to future-oriented LT goals and gains (Hilgard, 1962; Hoch & Loewenstein, 1991). The current study chose to denote these divergent pathways as system 1 and system 2 respectively, as per the work of Kahneman (2011). I predicted that individuals use system 1 processes to facilitate behaviour when primed with goal conflict. Moreover, I predicted that when primed with goal affirmation, individuals use system 2 processes in order to facilitate behaviour.

1.8 System 1 Processes

The first system is referred to as the experiential system, which operates at an unconscious level with little effort or deliberation (Jordan et al., 2003). This pathway is largely responsible for behaviour that is implicit, unconscious, or automatic in nature (Hofmann, Friese, & Strack, 2009). Automatic or system 1 (hot, fast, reactive, impulsive) processes are responsive to stimulus control, focused on the present, sensitive to punishment and threats, and operate impulsively (Metcalfe and Mischel, 1999). System 1 (primary) processes are efficient in terms of resource expenditure required to perform behaviour, yet rigid in the repertoire of behaviours they govern (Muraven & Baumeister, 2000). The current study proposes that

system 1 processes are responsible for avoidance-motivated behaviour that individuals use to disengage from goal conflict (Elliot, 1999; Blascovich, 2013). As per the dual-attitudes model proposed by Wilson, Lindsey and Schooler (2000), these system 1 processes largely occur automatically or implicitly, and therefore, implicit self-esteem was investigated.

1.8.1 Implicit self-esteem. Implicit self-esteem has been defined as "a self-evaluation that occurs unintentionally and often outside of awareness" (Farnham, Greenwald, & Banaji, 1999). On account of this, implicit measures are required to investigate the spontaneous or automatic responses that individuals make in relation to the unconscious views that one holds of themselves (Bosson, Swann, & Pennebaker, 2000). As a result, the Implicit Association Test (IAT) was developed by Greenwald and Banaji (1995) in order to provide a reliable measure of implicit social cognition (Ge, Huo, & Wenger, 2018). The IAT has been adopted as the most recognised measure of implicit self-esteem, as it is more reliable than other implicit measures in terms of internal consistency and test–retest reliability, and less subject to impression management than self-report measures (Dentale, Vecchione, & Barbaranelli, 2016). Farnham et al. (1999) suggested that if a genuine measurement of self-esteem is wanted, methods involving self-presentation should be bypassed completely through the use of indirect (implicit) measures of self-esteem (Jordan et al., 2003).

1.9 System 2 Processes

The second system is the conscious system of behaviour. It operates on an explicit level and is prompted by reason (Jordan et al., 2003). Controlled or system 2 (cool, slow, deliberate, reflective) processes consist of rational, effortful, and deliberate behaviour that is "responsible for higher order mental operations" (Hoffman, Friese, & Strack, 2009; Metcalfe and Mischel, 1999, Kahneman & Egan, 2011). System 2 (secondary) processes are costly in terms of

resource expenditure required to perform behaviour, yet flexible in the repertoire of behaviours they govern (Muraven & Baumeister, 2000). The current study proposes that system 2 processes are responsible for the approach-motivated behaviour that individuals use to engage in environments that promote goal affirmation (Elliot, 1999; Blascovich, 2013). As per the dual-attitudes model proposed by Wilson, Lindsey and Schooler (2000), these system 2 processes largely result in conscious or deliberate behaviour. As such, explicit self-esteem was investigated.

1.9.1 Explicit self-esteem. Explicit self-esteem can be conceptualised as the conscious or verbal attitudes, feelings and beliefs that one holds in regard to one's self-worth (Jordan et al, 2003). Rosenberg (1965) developed what has been to date the most widely recognised and used scale for the measurement of explicit self-esteem (Gray-Little, Williams, & Hancock, 1997; Robins, Hendin, & Trzesniewski, 2001). The Rosenberg self-esteem scale's (RSES) popularity has been accredited to a number of factors, such as its reliability, validity (Gray-Little, Williams, & Hancock, 1997; Robins et al., 2001), brevity, long history of use, and its ease of comprehension (Schmitt & Allik, 2005). Explicit measures are unfortunately prone to impression management from respondents. For accurate and unbiased data, respondents are required to answer honestly, carefully, and with a certain level of introspection (Toma, 2013).

In spite of these potential limitations within explicit measures, the current study aimed to extend the literature on differences between explicit and implicit self-esteem research. As previously stated, explicit and implicit self-esteem measures are predicted to operate under different underlying processes (Bosson et al., 2000; Farnham et al., 1999). The current study proposes that both system 1 and system 2 pathways compete to determine behaviour. System 1 processes are reflective of impulsive and unconscious behaviour, and therefore the current study used the IAT to investigate the relationship between implicit self-esteem and goal

motivation. In contrast, system 2 processes are reflective of controlled and conscious behaviour. As such, the Rosenberg self-esteem scale was used to investigate the relationship between explicit self-esteem and goal motivation. The current study is including both self-esteem measures for exploratory purposes in order to highlight the potential effects (if any) that these forms of self-esteem have on the relationship between goal motivation and self-control.

1.10 Self-Control

Dual-process models are also used to conceptualise the divergent relationship between self-control and *impulsivity* (Schelling, 1978; Ainslie, 1985). As stated above, impulsive behaviour is a function of system 1 processes, whereas self-control is a function of system 2 processes. Self-control or *self-regulation* is understood as the capacity to control one's inner responses and impulses (Tangney, Baumeister, & Boone, 2004). It has been referred to as among humankind's most valuable assets (Meier, Reinecke & Meltzer, 2016). Past research has linked low self-control (impulsivity) to binge eating, alcohol abuse, poor emotional regulation, lower academic grades, lower self-esteem (Tangney, Baumeister, and Boone, 2004), more unprotected sex, and higher addiction rates (Baumeister, Heatherton, & Tice, 1994; Muraven, Tice, Baumeister, 1998). Self-control requires individuals to inhibit and override competing urges, behaviours and desires (Baumeister et al., 1994; Muraven & Baumeister, 2000). It belongs to a system of processes known as executive functions. Together, executive functions form the cognitive control system responsible for making decisions, initiating and attending to actions, and regulating the self (Baumeister, 1998; Vohs et al., 2008).

Self-control plays a role in the setting of personal goals, and the navigation of behaviours towards said goals (Kuijer, 2016). Baumeister et al. (1994) reported that approximately 80%–90% of self-control in day-to-day life consists of *response inhibition*

(Baumeister, 2014). Responsible inhibition is defined by three different processes. The first process involves the inhibition of an initial dominant response to an event, causing a delay in responding. The second process involves the interruption of a continuing response, thereby ceasing the pattern of responding. The third process involves inhibiting competing events, behaviour and stimuli from interfering with goal-directed behaviour (Barkley, 2001). Successful self-control is therefore integral for the performance and maintenance of goal-directed behaviour.

Self-control can be measured at both the trait and state level. Individual differences in self-control are observed at the trait level, whereas the expenditure of self-control resources results in short-term decreases at the state-level (Baumeister & Vohs, 2007; Muraven & Baumeister, 2000; Muraven et al., 1998). In this sense, self-control resources are analogous to a commodity that can be expended for the performance of goal-directed behaviour. The current study looked to investigate the implementation of self-control to engage in superordinate goals (goals that affirm the self), versus the implementation of impulsivity to disengage from subordinate goals (goals that conflict with the self). The relationship between self-control and impulsivity has been personified as an internal contest for self-command between two forces, one myopic and one farsighted (Hoch & Loewenstein, 1991).

Impulsive individuals sacrifice larger long-term goals or rewards to pursue short-term goals or rewards. This behaviour is referred to as *immediate gratification* (Mischel, 1974; Baumeister & Heatherton, 1996). In contrast, *delayed gratification* is understood as a function of an individual's ability to exhibit self-control when pursuing long-term goals or rewards (Mischel, 1974). Individuals seek delayed gratification through short-term sacrifice in exchange for long-term goals or rewards. Therefore, individuals who are not willing to sacrifice immediate gratification for the attainment of delayed gratification may be seen as acting

impulsively, or without self-control; however, the current study proposes that these individuals instead may disengage from subordinate goals as a self-protective measure against ego-threat, and as a self-preservation measure in order to cease the expenditure of resources towards goals that are not core to an individual's self-identity. Goal motivation therefore determines goal engagement or disengagement. Through goal pursuit, individuals use their environment to satisfy their needs, and as per Ross and Nisbett (2011), their behaviour is the product of an interaction between the individual and their environment.

1.11 Uses and Gratifications Theory

Uses and gratifications theory (Katz et al., 1973) suggests that behaviour is driven by emotional, cognitive, social, and habitual needs that individuals satisfy and reduce through media usage (Rosen, Carrier, & Cheever, 2013). Hofmann et al. (2016) declared media use a "powerful source of intrinsic need satisfaction" (Reinecke et al., 2012). The psychological effects of media content such as social media largely depend on the reasons for the individual using it (Weiser, 2001). It is therefore imperative that media research continues to remain sensitive to the interaction between individuals and technology, which is perpetually evolving within the modern world. The current study chose to investigate online social media and academic print, as these two mediums provide an accurate exemplar of the two primary reasons for internet use, as adapted from research conducted by Weiser (2001). Social media and academic material can both be used to pursue goals, with the objective of satisfying an individual's needs. It is however predicted that the psychological effects of social media and academic study will differ as a function of an individual's self-esteem. Previous research on both topics has found that social media use negatively correlates with academic performance

(Kirschner & Karpinski, 2010; Hassell & Sukalich, 2016), although these effects may be moderated by individual differences in self-esteem.

1.11.1 Socio-affective regulation. Socio-affective regulation can be understood as the consumption of social and trivial information for the purposes of entertainment (Weiser, 2001). Socio-affective regulation is a means of regulating emotion through immediate social gratification (Weiser, 2001). It provides users with short-term satisfaction, a "feel-good" experience, akin to the sensation experienced by impulse shoppers, drug and alcohol users, and gamblers. Social media networks are a prime example of media content that provides socio-affective regulation. Boyd (2007, p. 211) defined social media as "web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system". Facebook, the largest social media network, engages a total of 1.5 billion daily users, and 2.2 billion monthly users (Facebook, 2018). As per research conducted by Atchley and Warden (2012), by "offering an often-gratifying escape from ongoing tasks, engagement with e-devices may occupy basic reward-related processes and even impact the fundamental mechanisms through which we valuate and process rewards" (Wilmer & Chein, 2016, p. 1607).

According to uses and gratifications theory, individuals may partake in socio-affective regulation as an escape from real-life, to relieve boredom, diminish loneliness, "pass the time", or seek validity (LaRose, Lin, & Eastin, 2003), and research has found that LSE individuals use social media more than HSE individuals (Vogel et al., 2014). Social media may promote goal affirmation for LSE individuals due to the immediate validation that individuals receive when using it. Research conducted by Gentile, Twenge, Freeman, and Campbell (2012) found that, depending on the site, youth who spent more time on their social media profile had a more

positive self-view. Similarly, Toma (2013) found that users experienced a significant boost in implicit state self-esteem after examining their Facebook profiles. Gonzales and Hancock (2011) also found evidence of increases to explicit self-esteem through social media use.

Social support via Facebook actually serves as a stress buffer, as per the buffer hypothesis (Greenberg et al., 1992; Nabi, Prestin, & So, 2013). Vohs and Heatherton (2001) theorised that when LSE individuals are threatened, they respond by directing their attention to social reinforcement mechanisms such as positive feedback, reassurance and a dependency on others. It becomes a coping mechanism for LSE individuals to receive social support and wellbeing reparation following negative emotional experiences (Berger & Buechel, 2012). In a longitudinal study conducted by Steinfeld, Ellison and Lampe (2008) it was concluded that LSE participants gained more from Facebook use than HSE individuals in terms of bridging social capital. For LSE individuals, social media is more than just a mode of keeping in communication with distant relatives. Goals which are pursued for socio-affective regulation may be less demanding of resources and more immediately gratifying, thus appealing to the needs and capacity of LSE individuals. The current study proposes that HSE individuals do not directly pursue self-esteem (Kernis, 2003) and are not therefore motivated to pursue social media in order to diminish their psychological needs in the same way as LSE individuals. As such, social media is anticipated to promote goal conflict in HSE individuals, relative to the performance of academic study, due to the proposition that social media is incongruent with their superordinate goals.

1.11.2 Goods-and-information acquisition. As per Weiser (2001), the alternative use for internet media is for the acquisition of goods and information. It is defined by its utilitarian approach to the accessing and sharing of content online (Weiser, 2001), and gratified through information mediums such as Google Scholar, Wikipedia, and online tutorials. Goods-and-information content would be considered consistent with self-actualization or growth needs, as per Maslow's (1970) expanded hierarchy of needs. Academic material is considered indicative of goods-and-information acquisition, particularly within the context of academia. It requires short-term sacrifice (akin to delayed gratification) and provides information that yields long-term benefit (Weiser, 2001). Personal resources such as self-control are expended in the process of consuming academic material, in order to work towards LT goals such as passing academic examinations, or completing a qualification.

The current study proposes that goods-and-information acquisition promotes goal affirmation for HSE individuals, by reinforcing goals in domains where they are both confident and motivated to achieve. HSE individuals are more adept at delaying gratification in regard to the pursuit of long-term goals (Duckworth & Seligman, 2005), such as goals that are facilitated through the acquisition of goods and information. Comparatively speaking, LSE individuals are anticipated to experience ego-threat from the pursuit of LT goals for the purpose of goods-and-information acquisition. This is predicted based on the premise that using online media to the pursue goods-and-information acquisition yields less immediate gratification in comparison with the consumption of online media for socio-affective regulation purposes.

The expenditure of personal resources such as self-control on LT goals may be perceived as too large of a short-term sacrifice for LSE individuals, with not enough certainty for future reward. Take the following example of the potential ego threat that an LSE individual can experience when primed with academic material relevant to an upcoming exam. The presentation of academic material content may elucidate feelings of inadequacy by highlighting

the discrepancy between: (a) their and other students' abilities and/or performance; (b) what they know and what they need to know prior to the exam; (c) their current affect and their predicted affect if they were to expend resources on studying and still fail. Therefore, I anticipate LSE individuals to be less motivated than HSE individuals to engage in content that provides goods-and-information acquisition, due to goal conflict.

1.12 Current Research

The aim of the current study is to establish the effects of participation in social media and academic study on self-control as a function of individual differences in implicit and explicit self-esteem. This will be done by having participants complete both explicit and implicit self-esteem measures pre-manipulation, followed by participation in either the social media, or academic study condition. State self-control will be measured post-manipulation through tasks that require response inhibition.

1.13 Hypotheses and Research Aims

Hypothesis 1 – Participants with LSE will exhibit less self-control when performing cognitive activities following participation in an academic study task than with participation in a social media task.

Individuals are motivated to approach situations that are congruent with their goal schema and to avoid situations which are incongruent. The academic study condition is considered a task non-congruent with an LSE individual's proximal goal schema. This is due to LSE individuals having less confidence in their ability to successfully pursue LT goals such as academic success, and also due to these goals competing for resources with the superordinate goals they uphold (i.e., the boosting and maintenance of self-esteem through socio-affective

regulation). Consequently, LT goals promote ego threat for LSE individuals due to the negative consequences that failure could have on their self-worth. Moreover, these goals do not provide the immediately gratifying self-esteem boost that LSE individuals seek from stimuli within their environment. LSE individuals will therefore be motived to disengage from environmental stimuli that elucidate goal conflict. It is predicted that LSE individuals will subsequently adopt avoidance motivation strategies when primed with the academic study condition. I hypothesise that, as a result, LSE individuals will show signs of sub-optimal self-control performance during the post-manipulation cognitive tasks (i.e., impulsive behaviour when responding).

Hypothesis 2 – Participants with HSE will exhibit lower levels of self-control when performing cognitive activities following participation in a social media task than with participation in an academic study task.

An HSE individual's goal schema is structured around the fulfilment of high-order needs that provide purpose and self-fulfilment. Research done by Sagioglou and Greitmeyer (2014) concluded that Facebook has a negative impact on affective well-being due to being less useful, less meaningful, and a bigger time-waste in comparison with other online activities. I hypothesise that HSE individuals will be less motivated than LSE individuals to attend to social media content as it does not predict success at LT goals. A primary function of social media content is that it provides users with a means to pursue socio-affective regulation. This content is predicted to elucidate goal conflict in HSE individuals. HSE individuals' self-esteem is more stable, and less contingent on constant acceptance and immediate gratification (Kernis, 2003), and therefore these individuals see less benefit in devoting resources to emotion regulation. This is not to say that HSE individuals cannot perform and enjoy behaviour that leads to immediate gratification, but rather that their use of social media is not driven by a need

to diminish self-esteem needs through socio-affective regulation. Therefore, the ritual of social media performance may present itself as a subordinate goal to HSE individuals. The elucidation of goal conflict is predicted to result in diminished motivation to exert resources on tasks relating to subordinate goals. Subsequently, I theorise that following the performance of social media, HSE individuals will not be motivated to excite controlled behaviour on self-control tasks, thus resulting in sub-optimal self-control performance (impulsive behaviour).

2 Method

2.1 Participants

Participants who completed the current study were 231 undergraduate psychology students enrolled in a first-year psychology course, Brain, Behaviour, and Cognition. Participants were recruited through the University of Canterbury's psychology department participant pool. Data from 16 participants were omitted for the following reasons: (a) Participants who were randomly assigned to the social media condition but did not possess a social media account (n = 6); (b) participants who failed to complete all aspects of the study (n = 4); (c) those that made too many errors according to Greenwald, Nosek and Banaji's (2003) IAT algorithm (n = 6). Therefore, 215 participants were included in the final data analysis. This sample included 49 males and 166 females (78.6% of participants were aged 17 to 20 years).

The final sample consisted of 104 participants in the social media condition, and 111 participants in the academic study condition. The sample was predominantly participants of a New Zealand European background (82.8% self-identified as New Zealand European or Pakeha, 14.4% as Māori, 8.4% as Asian, 3.3% as Pacific Islander, 1.4% as African, 0.9% as Filipino, 0.5% as Peruvian, 0.5% as British, 0.5% as Dutch, 0.5% as Indian, 0.5% as South African, and 0.5% as Singaporean Indian). It should be noted that some participants reported identifying with two or more of the above ethnicities, and were therefore counted in multiple racial categories. Moreover, 90.7% of the sample population reported to be New Zealand citizens, and 92.1% reported English as their first language The sample population comprised a diverse range of socio-economic statuses, with participants rating themselves on a scale of 1 to 10 by using the number value to describe where they currently perceived themselves to stand

socio-economically relative to other people in their community (mean = 5.88, SD = 1.7). Lastly, 85.1% of the sample population reported to being right-handed.

2.2 Materials

2.2.1 Condition manipulation.

2.2.1.1 Academic study. Participants were provided with study material content from "Psychology" (Schacter et al., 2015), the assigned course textbook for the Introductory Psychology paper (PSYC 105) that all participants were enrolled in. Participants were provided with 12 A4-sized colour page copies from the chapter "Neuroscience and Behaviour" (Schacter et al., 2015) as this was a unit all participants were required to learn for an upcoming test. Participants were provided with this material as it was reflective of a LT goal relevant to all participants. Participants were advised that the material provided to them would be relevant to this examination and were advised to interact with the content as they typically would when studying for an exam. Participants were advised that they would be asked questions on the academic study condition at the end of the experiment, and to therefore use the time productively. Participants were provided with the study materials and then each was timed individually. Participants were instructed to keep studying until a research assistant advised them on the next section of the study. Once a participant had completed 15 minutes, the study materials were removed from the participant and they were directed to the dependent variable (Go/No-Go task). Participants at no time knew of a condition other than the one they were in.

2.2.1.2 Social media. Participants were provided with a computer monitor with access to the Internet. Participants were advised to use the computer to access their own personal social media accounts (Facebook, Instagram, Twitter, Tumblr) and interact with the content as they typically would in their leisure time. Participants were advised that they could use multiple

social media accounts if they had access credentials to these accounts. The research assistant advised participants that they were, however, prohibited from using any instant messaging format on their chosen social media accounts. Participants were advised that they would be asked questions at the end of the experiment about their time spent performing the condition. Participants were individually provided with instruction on when to start, and then each was timed individually. Participants were instructed to keep at the task until a research assistant advised them to stop. Once a participant had completed 15 minutes, the study materials were removed from the participant who was directed on to the Go/No-Go task. Participants at no time knew of a condition other than the one they were in.

2.3 Pre-measures

2.3.1 Demographic measures. All participants initially completed a series of pre-measures including demographics such as age, gender, ethnicity, socio-economic status, primary language spoken, and handedness (refer to Appendix B, Figure 2).

2.3.2 Explicit self-esteem measure. Explicit self-esteem was measured using the Rosenberg self-esteem scale (Rosenberg, 1965). Participants rated their self-esteem on the 10-item Rosenberg (1965) self-esteem scale using items such as: *I take a positive attitude toward myself* and *I feel I do not have much to be proud of* (reversed; refer to Appendix C, Figure 3). The questionnaire was scored using a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree). Cronbach's α for the current study was .92, indicating acceptable internal consistency of the explicit self-esteem questionnaire.

2.3.3 Implicit self-esteem measure. Implicit self-esteem was measured using a self-esteem Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). The IAT was

created and presented using Inquisit software version 5.0.4 (Millisecond, 2016), and followed the procedure described by Greenwald and Farnham (2000). The IAT measures how fast subjects can make an association categorising self-items with pleasant items, in comparison with non-self-items (Greenwald & Farnham, 2000). Category labels on the left side of the screen are represented by the left key *e* and category labels on the right side of the screen are represented by the right key *i* (refer to Appendix D, Figure 4). Participants are instructed to rapidly classify stimuli based on which category (left or right) they associate the stimuli with. Stimuli are presented on the screen until the participant makes the correct response, at which point the next trial begins. The self-esteem IAT consists of different blocks, where participants' associations between pleasant and unpleasant words are paired with attributes to the *self* or *others*. For example, if participants responded faster (with accuracy) to an association between the self and positive words such as *smile* and *happy*, than to negative words such as *agony* and *gloom*, then it could be attributed to a stronger implicit association for positive attitudes to the self, in comparison with others (see Figure 1). Moreover, faster responses (with accuracy) to negative attributes towards others (non-self), in comparison with the self may also imply a negative view of others, in comparison with the self. Participants performed a total of 160 trials throughout the different blocks, including a sum of 80 practice and 80 critical trials. The procedural steps were counterbalanced to control for order effects (Greenwald et al., 1998).

2.3.4 Trait self-control. A 36-item questionnaire was used to investigate trait self-control (Tangney, Baumeister, & Boone, 2004). The questionnaire was scored using a five-point Likert scale (1 = very rarely, 2 = rarely, 3 = sometimes, 4 = often, 5 = very often) and included items such as *people would describe me as impulsive* (reversed; refer to Appendix E, Figure 4). Cronbach's α was .89, indicating acceptable internal consistency of the trait self-control questionnaire in the current study.

2.3.5 Go/No-Go task. The Go/No-Go task was used to measure state self-control via the inhibition of responses to on-screen stimuli. The Go/No-Go task was designed and presented using E-Prime 3.0 software (Psychology Software Tools, 2016). It was implemented due to its strong history as a reliable measure for self-control (Simmonds, Pekar & Mostofsky, 2008). At the start of the task, participants were instructed to sit facing their computer monitor, with their keyboard directly in front of them, at an accessible distance from their body. Participants were advised to adjust their seat positioning so that they were comfortable to respond via operation of the keyboard to stimuli presented on the computer monitor. Participants were provided with on-screen instructions regarding the objectives and rules of the task. The task consisted of 280 trials that ran consecutively. The trials consisted of four different target stimuli, (go stimuli, no-go stimuli, prime stimuli and distractor stimuli; refer to Appendix F, Figures 6-8). The target stimuli were presented in 70 point Times New Roman font in white, in the middle of a black screen. Stimuli were presented for a period of 320 ms, and each target stimulus was followed by a 1000 ms inter-trial interval. Participants were advised that target stimuli would be presented in a random sequence continuously in the centre of the screen. Participants were advised that following the presentation of the letter *k* (go stimulus) they were to respond by pressing the letter *o* on the keyboard, but only on trials where the go stimulus had been preceded by the letter *n* (prime stimulus). Trials where the prime stimulus was not succeeded by the go stimulus were classified as no-go stimuli trials and required no response. Each participant performed 14 practice block trials, and 260 main block trials. Within the main block trial, each participant performed 100 distractor trials, 100 go trials and 60 no-go trials. Responding via pressing the letter *o* was only required on go trials. Subsequently, any responding on distractor trials, prime trials, and no-go trials was referred to as a commission error, and was sub-optimal performance. Therefore accuracy, but not response times, was recorded for these particular trials. Responding to go trials was indicative of optimal

performance, and therefore both accuracy and response times were recorded for these particular trials. Failure to respond to go trials by not pressing letter *o* is referred to an omission error, and considered sub-optimal performance.

2.4 Design

The independent variable manipulated in this study was the social media (N = 115) and academic study (N = 116) conditions. The dependent variable measured response inhibition by recording the response times and accuracy to responses on the cued Go/No-Go task (Fillmore, 2003). The moderator variables measured explicit and implicit self-esteem respectively. The study took approximately 70 to 90 minutes to complete, and participants were given course credit for participation. All procedures were approved by the Human Ethics Committee at the University of Canterbury (refer to Appendix G). Data were collected over a series of experimental setting sessions through Semester One of the 2018 academic year.

2.5 Procedure

Participants enrolled voluntarily for a study titled "The Internet, Personality, and your Behaviour". The study was described as being focused on *the relationship between personality, and how its relationship with information and technology can influence behaviour.* Furthermore, it was stated that the prerequisites for the study included participants who had basic experience using the Internet, and were currently enrolled in the PSYC 105 course. Participants were not provided any further information prior to attending the study.

The experiment was conducted in a single computer laboratory. The room contained a grid of six rows of computers, with five to six computers in each row. Each row alternated the direction at which participants faced in order to mitigate the risk of social interaction during

the experiment. Each desk was separated by a partition and each cubicle contained a computer, keyboard and seat. Upon entering the room, participants were advised by a research assistant where they were to be seated. All participants were seated in an alternating fashion where no two neighbouring computers were occupied.

Participants were briefed on the outline of the experiment, and subsequently advised to remain seated and not interact with any personal belongings (mobile phones, MP3s, laptop computers) or other participants for the duration of the study. Furthermore, participants were advised that the laboratory computers were only to be used for the purposes of the experiment. Participants were advised that the study was divided into three phases, at which point they were given a brief outline of what each phase would entail (refer to Appendix H). Participants were asked for written and verbal consent prior to the study commencing (refer to Appendix I). Each participant was provided with a unique code in order to protect their anonymity. Participants entered this code at the beginning of every task throughout the study, under the supervision of a research assistant. Participants were advised that their participation was voluntary, and they could leave at any time if they so wished.

2.5.1 Phase 1: Following consent, participants completed a battery of demographic and personality measures. These measures were presented and recorded online using Qualtrics Research Suite software (Version 57,005; 2014). Following completion of the questionnaires, participants were directed to a link for the self-esteem IAT (Greenwald et al., 1998) where they were provided with on-screen instructions on how to perform the task. All data were presented and recorded online using Inquisit software (Version 5.0.4; Millisecond, 2016). Participants were then advised phase 1 had been completed, and they were now commencing phase 2 (condition manipulation), which they were advised to use as a "refocus period" between phases 1 and 3.

2.5.2 Phase 2: Participants were provided both verbal and written instructions on expectations during the condition manipulation (performance of social media/academic study). A research assistant was present at all times to assist participants with any queries or concerns. Upon completion of their assigned condition, participants were prompted to return the study materials supplied to them in the academic study condition; whereas participants in the social media condition were prompted to log out of all social media accounts. Each participant was provided with individual assistance with the completion and commencement of each separate phase of the experiment to ensure all participants followed the same process.

2.5.3 Phase 3: Following completion of phase 2, participants were advised they would be playing an online game. The games consisted of the cued Go/No-Go task. All data was presented and recorded using E-Prime 3.0 software (Psychology Software Tools, 2016). Instructions for the task were given on screen. Upon completion, participants were provided with a post-assessment self-report questionnaire (refer to Appendices J & K) in order to ascertain whether participants were aware of the purpose of the study, and also for participants to rate how they felt during and post-manipulation. Participants were also able to provide feedback on questions such as *sometimes I just clicked random responses in order to get through this study as quickly as possible* and *I found the instructions hard to understand*. The questionnaire was scored using a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree). Participants submitted the post-assessment questionnaire with their unique code and were subsequently provided with a debriefing form prior to leaving (refer to Appendix L). All data were collected for each participant within one session.

3 Results

Data were analysed using IBM SPSS Statistics Version 25.0 and Microsoft Excel Version 2010. The multiple regression analyses reported below used the PROCESS macro (Hayes, 2017) for computing all interaction effects and conditional indirect effects in moderator models.

3.1 Implicit Self-Esteem Scores

IAT-D scores were calculated following the procedures outlined in Greenwald et al. (2003). An individual's implicit self-esteem score was calculated to create an IAT-D score, where any IAT-D score larger than 0.0 would suggest that the respondent had a bias for more positive associations towards the self in comparison with others; however, a negative score would suggest more positive implicit associations towards others compared with the self. IAT-D scores for the current study ranged from −0.79 to 1.82 (M = 0.66, SD = 0.46) suggesting that, on average, participants had positive self-regard at the implicit level.

Implicit self-esteem was controlled for during statistical analyses as specified. This was performed by taking into account individual differences in implicit self-esteem, and separating these confounding effects from the relationship between explicit self-esteem, goal motivation and state self-control.

3.2 Explicit Self-Esteem scores

Responses collected from the Rosenberg self-esteem scale were used to measure explicit self-esteem. Each question was coded and scored from 1 to 5, with lower scores reflecting lower self-esteem. Scores for each question were added together, giving each participant an overall explicit self-esteem score (possible score range 10 to 50). Explicit self-

esteem scores for the current study ranged from 12 to 50 (M = 33.25, SD = 8.19), suggesting that, on average, participants had positive self-regard at the explicit level. No significant correlation was found between explicit and implicit self-esteem scores (r = .006, p = .93).

Explicit self-esteem was controlled for during statistical analyses as specified. This was performed by taking into account individual differences in explicit self-esteem, and separating these confounding effects from the relationship between implicit self-esteem, goal motivation and state self-control.

3.3 Trait Self-Control Scores

Responses collected from Tangney, Baumeister and Boone's (2004) self-control scale were used to measure trait self-control. Each question was coded and scored from 1 to 5, with lower scores reflecting lower trait self-control. Scores for each scale item were added together, and this was averaged by the number of scale items to provide a mean self-control score for each participant (possible score range is 1 to 5). Trait self-control scores for the current study ranged from 1.53 to 4.44 (M = 3.08, SD = 0.47) with skewness of 0.02 (SE = 0.17), suggesting that participants' self-control scores were normally distributed.

Trait self-control was controlled for during statistical analyses as specified. This was performed by taking into account individual differences in trait self-control, and separating these confounding effects from the relationship between self-esteem (implicit, explicit), goal motivation and state self-control.

3.4 State Self-Control Scores

Data collected from the no-go trials of the Go/No-Go task were used to measure response inhibition (state self-control). Response times were recorded in milliseconds (ms) and accuracy was recorded as a decimal, i.e. 80% of trials responded correctly = .8 accuracy score. Results were aggregated for each participant across no-go trials.

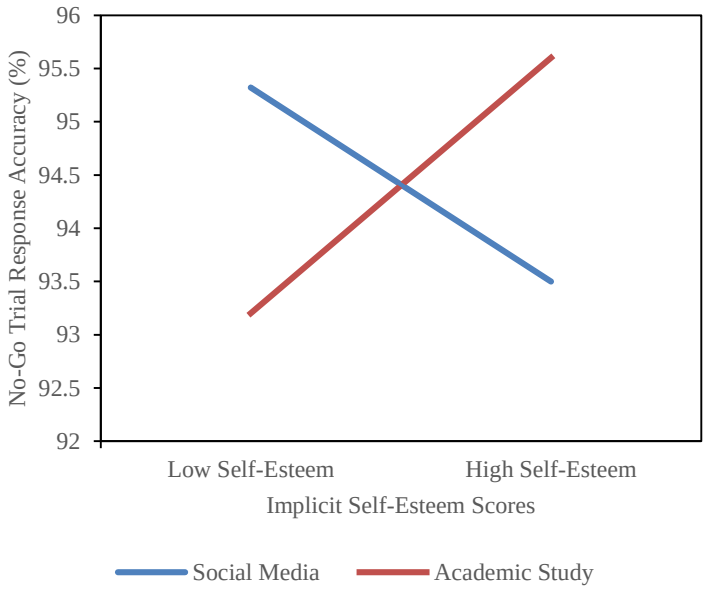
3.5 Statistical Analyses (*N* = 215)

3.5.1 Explicit self-esteem. Multiple regression analyses with 5,000 bias-corrected bootstrapped resamples were computed to investigate the interactive effects of explicit self-esteem and condition on response accuracy to no-go trials (i.e., self-control). No significant interaction effects (Explicit Self-Esteem × Goal Motivation) were found, $F(1, 211) = .089$, $p = .766$, R^2 change < .001.

These analyses were run again while controlling firstly for trait self-control, and secondly for implicit self-esteem. However, no significant interaction (Explicit Self-Esteem × Goal Motivation) emerged when controlling for trait self-control $F(1, 210) = .259$, $p = .611$, R^2 change < .001, or implicit self-esteem $F(1, 210) = .072$, $p = .789$, R^2 change < .001.

3.5.2 Implicit Self-Esteem. Multiple regression analyses with 5,000 bias-corrected bootstrapped resamples were next computed to investigate the interactive effects of implicit self-esteem and condition on response accuracy to no-go trials (i.e., self-control). The model showed a significant interaction effect (Implicit Self-Esteem × Goal Motivation), $F(1, 211) = 7.103$, $p = .008$, R^2 change = .033 (refer to Graph 1).

Graph 1. Relationship between media condition and accuracy of responses to no-go trials as moderated by implicit self-esteem



The Johnson-Neyman technique was then used for calculating the levels of implicit self-esteem at which there were significant differences between academic study and social media conditions. Using the Johnson–Neyman technique, it was found that for participants with an IAT-D score ≤ 0.034, participants in the academic study condition showed significantly less self-control than those in the social media condition. This means that for participants in the bottom 12.56th percentile of implicit self-esteem scores, low implicit self-esteem significantly moderated the relationship between goal motivation and self-control scores (for further details refer to Appendix M, Table 1). This finding supports hypothesis (1) by providing evidence that low implicit self-esteem individuals performed with less accuracy on no-go trials after performing the academic study condition than those in the social media condition.

Furthermore, the Johnson–Neyman technique showed that for participants with an IAT-D score ≥ 0.989, participants in the social media condition showed significantly less self-control than those in the academic study condition. This means that for participants in the top 23.26th percentile of implicit self-esteem scores, high implicit self-esteem significantly

moderated the relationship between goal motivation and self-control scores (for further details refer to Appendix M, Table 1).The above analysis supports hypothesis (2) by providing evidence that high implicit self-esteem individuals performed with less accuracy on no-go trials after performing the social media condition than those in the academic study condition.

These analyses were run again while controlling firstly for trait self-control, and secondly for implicit self-esteem. A significant interaction effect (Implicit Self-Esteem × Condition Manipulation) was still present after controlling for trait self-control, $F(1, 210) = 7.797$, $p = .006$, R^2 change = .035. Furthermore, controlling for explicit self-esteem did not alter this effect of Implicit Self-Esteem × Condition on Self-Control, $F(1, 210) = 7.259$, $p = .008$, R^2 change = .033.

3.6 Further data cleaning

A secondary set of statistical analyses were run using more stringent cut-off parameters for the exclusion of data for hypothesis testing. Exclusion parameters were set to remove participants who failed to act within the best interests of the study. This was performed to remove any potential bias from the dataset of participants who self-reported as responding inattentively.

As a result, data was omitted for participants who self-reported in the post-assessment questionnaire that they either *agree* or *strongly agree* with the statement *I sometimes just clicked random responses in order to get through this study as quickly as possible* ($n = 8$); for participants who self-reported that they *strongly agree* with the statement *I found the instructions hard to understand* ($n = 1$); and for participants who self-reported that they *strongly disagree* with the statement *I gave this study my undivided attention* ($n = 1$). Following these exclusions, 205 participants were included in the secondary data analysis. The same

statistical analyses were repeated to ascertain if the hypotheses would still be confirmed with stricter data exclusionary parameters.

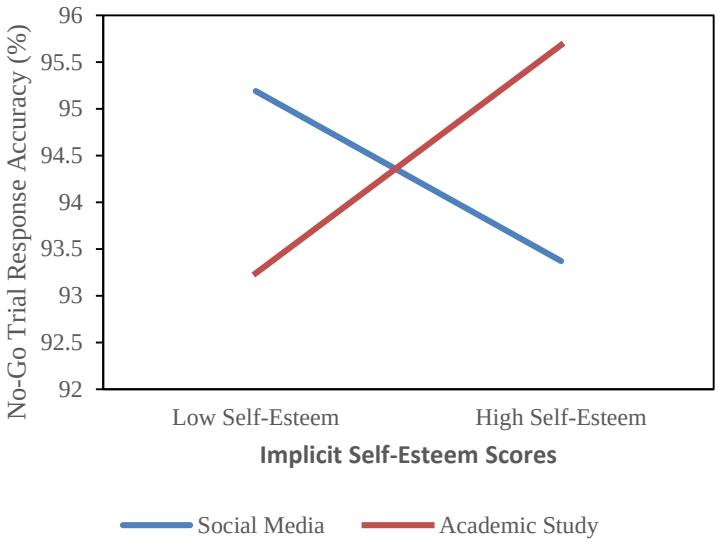
3.7 Statistical Analyses for Stricter Exclusionary Data Parameters (*N* = 205)

3.7.1 Explicit Self-Esteem. Multiple regression analyses with 5,000 bias-corrected bootstrapped resamples were computed to investigate the effects of explicit self-esteem as a moderator variable on the relationship between condition and response accuracy to no-go trials. No significant interaction effects (Explicit Self-Esteem × Goal Motivation) were found, $F(1, 201) = .067$, $p = .796$. R^2 change < .001.

These analyses were run again while controlling firstly for trait self-control, and secondly for implicit self-esteem; however, no significant interaction (Explicit Self-Esteem × Goal Motivation) emerged when controlling for trait self-control $F(1, 200) = .153$, $p = .696$, R^2 change = .001, or implicit self-esteem $F(1, 200) = .053$, $p = .818$, R^2 change < .001.

3.7.2 Implicit Self-Esteem. Multiple regression analyses with 5,000 bias-corrected bootstrapped resamples were next computed to investigate the effects of implicit self-esteem as a moderator variable on the relationship between condition and response accuracy to no-go trials for exclusionary dataset parameters 2. The model showed a significant interaction effect (Implicit Self-Esteem × Goal Motivation), $F(1, 201) = 6.947$, $p = .009$, R^2 change = .033 (refer to Graph 2).

Graph 2. Relationship between media condition and accuracy of responses to no-go trials as moderated by implicit self-esteem



Using this model, analyses were run using the Johnson–Neyman technique. The Johnson–Neyman technique found that for participants with an IAT-D score ≤ 0.046, participants in the academic study condition showed significantly less self-control than those in the social media condition. This means that for participants in the bottom 12.68th percentile of implicit self-esteem scores, low implicit self-esteem significantly moderated the relationship between goal motivation and self-control scores (see Appendix N, Table 2). This finding supports hypothesis (1) by providing evidence that low implicit self-esteem individuals performed with less accuracy on no-go trials after performing the academic study condition than those with the social media condition.

Furthermore, the Johnson–Neyman technique showed that for participants with an IAT- D score ≥ 1.035, participants in the social media condition showed significantly less self-control than those in the academic study condition. This means that for participants in the top 19.51th percentile of implicit self-esteem scores, high implicit self-esteem significantly moderated the relationship between goal motivation and self-control scores (see Appendix N, Table 2). This analysis supports hypothesis (2) by providing evidence that high implicit self-

esteem individuals performed with less accuracy on no-go trials after performing the social media condition than those with the academic study condition.

These analyses were run again while controlling firstly for trait self-control and secondly for explicit self-esteem. A significant interaction effect (Implicit Self-Esteem × Condition Manipulation) was still present after controlling for trait self-control, $F(1, 200) = 7.576$, $p = .007$, R^2 change = .036. Furthermore, controlling for explicit self-esteem also consistently yielded a significant interaction term $F(1, 200) = 1.869$, $p = .008$, R^2 change = .034.

4 General Discussion

The current research sought to extend the literature on the effects of goal motivation on self-control, as a function of differences in self-esteem. Specifically, I wanted to explore whether this relationship was facilitated through explicit or implicit self-esteem processes. This was examined by measuring participants' self-control performance on cognitive activities, following engagement in either social media or academic study conditions for a period of 15 minutes. These conditions were selected based on research into uses and gratifications theory (Katz et al., 1973; Weiser, 2001), which proposes that individuals use media consumption in order to satisfy and reduce social, emotional, cognitive, and habitual needs (Rosen, Carrier, & Cheever, 2013). State self-control was assessed through accuracy of response inhibition to trials on a cued Go/No-Go task. Self-esteem was measured through explicit and implicit measures. The current study found implicit self-esteem (automatic or unconscious feelings towards oneself) significantly moderated the effects of goal motivation (the performance of social media versus academic study) on self-control. In comparison, explicit self-esteem (explicit or deliberate feelings towards oneself) had no significant effect on self-control, following participation in social media versus academic study.

The findings support hypothesis 1 predictions that LSE individuals who performed academic study showed more impulsivity on self-control tasks than LSE participants who performed social media. This suggests that priming LSE individuals with stimuli that promote goal conflict (i.e., academic study) results in more impulsive behaviour on subsequent unrelated tasks, in comparison with stimuli that promotes goal affirmation (social media). LSE individuals are less motivated to engage in environments that promote self-fulfilment needs through goods-and-information acquisition, than in environments that fulfil self-esteem needs through socio-affective regulation. This provides support to previous research from Oberst et

al. (2017), Tice and Bratslavsky (2000), and Tice, Bratslavsky, & Baumeister (2001), who found that people give precedence to the ST goal of affect regulation over other self-regulatory goals when threatened, by engaging in impulsive behaviours as a means of making themselves feel better.

As predicted in hypothesis 2, HSE individuals who performed social media showed more impulsivity on self-control tasks than HSE participants in the academic study condition. These results suggest that priming HSE individuals with stimuli that promote goal conflict (i.e., social media) results in more impulsive behaviour on subsequent unrelated tasks in comparison with stimuli that promote goal affirmation (academic study). HSE individuals are less motivated to engage in environments that promote self-esteem needs through socio-affective regulation than in environments that satisfy self-fulfilment needs through goods-and-information acquisition. The results provide support for Maslow's hierarchy of needs (1943, 1954, 1970), reinforcing the theory that needs are hierarchically structured in terms of importance, and that this structure may therefore influence an individual's motives. As stated by Kernis (2003), HSE individuals do not truly seek out behaviour to directly increase or maintain self-esteem. As a consequence, the needs that HSE individuals satisfy through social media use do not carry the same importance within their goal schema, and so HSE individuals receive less benefit from pursuing social media for socio-affective regulation purposes in comparison to LSE individuals. A decline in self-control may reflect decreased motivation to engage in goal-directed behaviour pertaining to that task (Muraven & Baumeister, 2000). I therefore propose from the current findings that HSE individuals were less motivated to engage in social media, and as a result exhibited sub-optimal self-control.

The current findings reflect that individuals can hold conflicting conscious and unconscious views regarding their own self-worth. This account of the results provides further

support for the dual-attitudes model perspective (Wilson, Lindsey and Schooler, 2000), proposing that two related yet divergent systems determine behaviour as a product of implicit and explicit processes. These results also provide support that implicit self-esteem operates through system 1 (hot, fast, reactive, impulsive) processes (Jordan et al., 2003). Because self-esteem has strong consequences over emotion, the maintenance of self-esteem is predominantly controlled by system 1. This pathway is responsible for facilitating implicit or unconscious behaviour (Houben & Wiers, 2009). Activation of this hot, emotional system leads to automatic or reflexive responses (Crocker & Park, 2004) such as the impulsive responses emitted by individuals on the Go/No-Go task, following the elucidation of goal conflict.

An individual's unconscious or implicit thoughts, attitudes and beliefs can determine impulsive behaviour under environments that promote threat to the self. Because impulsive responding largely occurs unconsciously, implicit processes govern the performance of impulsive behaviour (Hofmann, Friese, & Strack, 2009). It can be reasoned, therefore, that impulsive responding is considered a mechanism of system 1 pathways, and that individuals' act under command of these processes when experiencing threat to the self. By acting under command of system 1 processes when faced with goal conflict, individuals may not be explicitly or consciously aware of any changes in their behaviour. The current findings suggest that individuals' behaviour can be determined by thoughts, attitudes and beliefs which they hold unconsciously or without deliberation. Therefore, implicit measures may be more sensitive than explicit measures when investigating an individual's motives towards the pursuit of different goals.

4.1 Theoretical and Practical Implications

As the ubiquity of digital media continues to grow, the outreach of social media continues to seep in to our everyday lives. Portable devices such as mobile phones, tablets and laptops provide users with unlimited access to an endless stream of entertainment and interaction. As a result, users find difficulty in juggling the short-term pleasures provided from media use, with the repercussions that this media use has on their LT goals (Hofmann, Reinecke & Meier, 2016). Online media is an ever-evolving cyborg and it is imperative that the field of social psychology continues to work closely with cyber-psychology in an effort to investigate the psychological effects that these media formats have on individuals.

Much of the research conducted on social media has looked at dissecting its' performance ritual into many discrete elements. Past literature has focused on how Facebook users respond to their own profiles versus the presentation of others (Gonzales & Hancock, 2011); negative versus positive feedback received online (Valkenburg, Peter, & Schouten, 2006); upward versus downward online social comparisons (Vogel et al, 2014); and close versus distant online friends (Wilcox & Stephen, 2012). The current study instead looked to capture the phenomena of the consumption of both academic material and social media, using the least invasive approach possible. As such, participants in both conditions were not given direction on how they should utilise the content (social media and academic study materials) during the condition. This was in the hopes of participants' interacting with the content in a way that best mimics how academic material and social media content is consumed in a personal setting. The aim of this study was to provide participants with the holistic experience that consumers of both social media and academic study regularly contend with.

As self-control was significantly predicted by an interaction between implicit self-esteem and goal motivation, the results of this study may shed light on the manifestation of

behaviours that individuals were not conscious of. It is important for individuals to be cognisant of what motivates them to approach and avoid certain goals within their environment. The implications of these results may extend as an explanation for impulsive responding in environments that do not affirm an individual's proximal goal schema. For LSE individuals, the current findings could have implications which extend in to education settings based on their need for immediate social gratification. Learning could be structured for LSE individuals to endorse a reward schedule around this need for constant gratification by implementing positive reinforcement in short-term increments as progress is made. These individuals could look to break down LT goals by *chunking*, breaking down a difficult goal into manageable chunks. Incentives such as feedback from friends, family, teachers, coaches, and bosses may work to provide social gratification.

Moreover, LSE individuals could look to implement self-affirmation practices, prior to taking on potentially ego-threatening tasks. This supports the work of Steele et al. (1993), who found that HSE individuals have greater affirmational resources and are subsequently more resilient to threats than LSE individuals (Sherman & Cohen, 2006). In fact, the intersection between self-affirmation and self-esteem is not novel to social psychology. Tesser (2000) reasoned that self-affirmation and self-esteem maintenance processes were interchangeable (Sherman & Cohen, 2006). Individuals can practise self-affirmation by thinking about or engaging in acts that empower their self-identity. Examples of this could be checking the sports results for a favourite team, researching a personal political ideology, thinking about family, a favourite hobby, or favourite band. By focusing on domains that individuals are good at and/or passionate about, this acts as a boost to the ego, similar to the effects of social media. If LSE individuals were made aware of the driving forces that compel their social media use, they could look to pursue these intrinsic needs in alternative "offline" settings.

As demonstrated during the study, goal conflict is experienced by both HSE and LSE individuals. The current research sheds light on differences in goal motivation as a function of implicit self-esteem. While these findings may not eliminate goal conflict, it may allow individuals to be mindful of their behaviour in the presence of threatening stimuli, in an effort to diminish impulsivity. Individuals' awareness of impulsivity and its triggers could have a profound positive impact on unhealthy behaviours such as smoking, overeating, and unsafe sex (Moffitt et al., 2011).

4.2 Limitations and Future Research

Despite the findings of the current study and their implications for both self-esteem and self-control, we must first consider possible methodological limitations. Firstly, the sample consisted of students enrolled in a first-year psychology paper at the University of Canterbury. Furthermore, 75.8% of the sample population reported as female, 82.8% identified as New Zealand European, and 78.2% of the population reported to being aged 17 to 20. These sample parameters limit the ability to generalise the results to a wider population. Furthermore, it is possible that first year psychology undergraduates provide a certain response bias due to a basic knowledge and understanding of how psychology research is conducted. In order to try to eliminate this bias, the inclusion of implicit self-esteem measurement through the use of the IAT was implemented.

The current findings showed that only participants who ranged in the bottom ~12th percentile of IAT-D scores showed significantly less self-control in the academic study than those in the social media condition. Due to positively skewed implicit self-esteem scores within the sample population, LSE in the current study was classified as IAT-D scores ranging between −0.79 and 0.46. It could be reasoned that IAT-D scores over 0.0 potentially depict a

more neutral implicit self-esteem, rather than an example of extremely low implicit self-esteem. These positively skewed implicit-self-esteem scores provide a plausible explanation for why moderately high implicit self-esteem scores had a significant relationship with goal motivation and self-control (refer to Appendices M & N), whereas in comparison, only low to extremely low implicit self-esteem scores predicted a significant relationship between goal motivation and self-control. Due to the sample population being composed of university students, the current sample may not accurately depict the full range of implicit self-esteem scores found in the general population. Future research could investigate using a sample of participants who have not pursued tertiary education, in order to explore possible differences between these two populations.

Further critique of the current study should address the methodology failure to implement a control condition, therefore the results of the current study can only be reported in terms of a comparison between conditions, making it impossible to ascertain if social media led to an increase in self-control, or if academic study led to a self-control decrease amongst LSE individuals. No control condition was implemented because of an inability to define what a suitable control condition would look like. Social media was identified as a suitable condition as it satisfies media users' need for socio-affective regulation, whereas academic study was selected as it provides its users with goods-and-information acquisition, as per the research conducted by Weiser (2001) into uses-and-gratifications theory. A control condition would need to have been unbiased towards both of these conditions, yet still maintain participant engagement.

The current study selected two conditions (social media and academic study) based upon the social and psychological effects of Internet use, as per uses-and-gratifications research (Katz, Blumler & Gurevitch, 1973; Weiser, 2001). I therefore attempted to implement two

conditions that were highly representative of how the two primary functions of Internet use (socio-affective regulation and goods-and-information acquisition) could be best elicited in an experimental setting within a period of 15 minutes, in order to elucidate goal motivation. As this study was very much exploratory in nature, this time period was not based on previous research. Further research could investigate how goal motivation changes as a function of time spent performing a task. Participant activity during the performance of social media and academic study was not qualitatively recorded (i.e., the depth of engagement within social media or academic study). However, it is proposed that the mere presentation of the condition, and the expectation to participate in it would have had subsequent effects on goal motivation, irrespective of whether the participant was engaged for the full 15 minutes. Even simply scrolling through social media has been found to increase self-esteem momentarily (Gonzales & Hancock, 2011; Wilcox & Stephen, 2012).

A critique of the current methodology should address that only one of the aforementioned conditions was performed "online". During the academic study condition, physical copies of print media were distributed to participants rather than providing an online or digital alternative, as per the social media condition. Whilst both conditions could have logistically been performed online in order to qualify both as "online media", the academic study content was provided as physical copies to participants in order to give research assistants greater control over how the content was managed. While all participants in both conditions were monitored throughout the experiment, the concern with providing the academic content online was the potential distractions that come with online access to study content. Unfortunately this factor could not be mitigated in the social media condition. This potentially provides an inconsistency between conditions that should be noted. It was reasoned, however, that whether presented in digital or print form, the academic material provided is consistent

with material consumed for the function of goods-and-information acquisition and should therefore elicit the same behaviour from participants regardless of its "offline" presentation.

During the social media condition, Facebook and Instagram were the only two social media applications that participants elected to use (Twitter and Tumblr were not elected for use). At the beginning of this condition, participants were advised to disable the direct messaging function available on these platforms. This was to prevent individuals from utilising social media purely for the chat function. I acknowledge that this is a large part of the appeal of social media platforms as it provides users with an instantaneous mode of communication to a wealth of contacts. However, this function of person-to-person messaging shares parallels with short message services (SMS). As such, it is predicted to fulfil different needs for users, as per the theoretical work of research conducted by Grellhesl and Punyanunt-Carter (2012) into uses-and-gratifications theory. Direct messaging provides users with immediate gratification, social inclusion, self-affirmation, and feelings of acceptance. However, as the content shared through direct messaging is limitless, the needs gratified by direct messaging are predicted to be a function of the meaning and intent of each discrete message. Future research could explore the differences between the short-term psychological effects of social media with and without the use of direct messaging platforms.

It would be disingenuous to not highlight other possible explanations for LSE individuals possessing a proclivity towards social media rather than academic study. In research comparing Twitter and Facebook conducted by Hughes et al. (2012), participants with a preference for Facebook rated themselves higher in sociability, extraversion and neuroticism, whereas participants with a preference for Twitter self-reported a higher need for cognition. It would be interesting to apply measures of sociability and need for cognition to the current study in order to see the influence these factors have on goal motivation. Future social media research

should look to explore the use of these other popular social media domains such as Twitter, Reddit, and Snapchat for comparative purposes as per Hughes et al. (2012).

Alternatively, further research could also include more traditional media content mediums such as television-watching, or alternative digital media content mediums such as YouTube or Netflix. Picture-based mobile dating applications (PMDA) such as Tinder have continued to gain momentum as popular ways to interact and seek gratification. These applications consist primarily of an index of images of potential romantic matches, and a direct-messaging service (Sumter, Vandenbosch, & Ligtenberg, 2017). Further studies could investigate goal motivation for online dating applications in comparison with the social media applications investigated in the current study.

The current study consisted exclusively of university students enrolled in an undergraduate psychology paper. Because all of these individuals were able to reach tertiary education, this suggests that LSE has not inhibited their ability to pursue academic goals to a certain extent. It should therefore be considered that these individuals may have found coping mechanisms to deal with ego threat and/or goal conflict experienced as a result of LT goals, and therefore other factors that contribute to the relationship between goal motivation and diminished self-regulation need to be explored. Research conducted by Barrett, Tugade, and Engle (2004) proposed that individuals high in working memory capacity are more successful at performing self-regulatory processes in order to protect goal-directed activity from impulsive behaviour.

Furthermore, the topics of self-esteem, self-control, academic study and social media use share much common ground in the literature with the behaviour of procrastination. Procrastination can serve an interesting cocktail of self-defeating, self-defensive, and integrity-reparative functions (Ferrari, 1991, 1994, 2000; Sherman & Cohen, 2006). Based on the

findings of the current study, I propose that research could explore the relationship between social media, procrastination and self-esteem. Factors like this could have a confounding relationship with goal-motivated behaviour and could therefore hold potential for future investigation.

4.3 Conclusion

In the current study, the hypothesis that implicit self-esteem moderates the relationship between goal motivation and self-control performance was supported. These findings endorse the notion that individuals are motivated to satisfy needs that are structured hierarchically, consistent with the work of Maslow (1943, 1954, 1970). The current study proposes that implicit self-esteem functions as a metaphorical score-counter for an individual's experiences with acceptance and success across all the domains that constitute their self-system. Implicit self-esteem therefore plays a role in negotiating whether an individual therefore approaches or avoids a particular goal within their environment. I propose that two factors determine whether an individual will be motivated to approach or avoid goals within their environment.

Firstly, an individual establishes whether their current environment can facilitate the pursuit of goals which satisfy their needs. Secondly, that individual needs to determine whether the benefits of successful goal pursuit will outweigh the costs of unsuccessful goal pursuit, as both outcomes will expend resources (such as self-control) in the process. If both of the above factors are met (the environment is congruent with an individual's needs, and the goal does not pose a threat to the individual's capacity), then affirmation of an individual's superordinate goals will increase motivation to engage within their environment.

However, when an individual's current environment and superordinate goals conflict, the individual subsequently experiences decreased motivation to engage (or increased

motivation to disengage) within their environment. Increased motivation results in increased expenditure of resources within the environment (i.e., an increase in self-control/decrease in impulsivity), whereas decreased motivation results in decreased expenditure of resources within the environment (i.e., decrease in self-control/increase in impulsivity). As adapted from the workings of Crocker and Wolfe (2001), I suggest goal congruency is determined by goals and behaviour that fit an individuals' goal schema.

This proposed account of the current results provides support that mental (cognitive and emotional) resources are valued as a limited resource by the individual (The Two Systems, [web page] 2012; Baumeister & Vohs, 2007). Furthermore, through differences found in implicit versus explicit self-esteem processes, the current study reinforces dual-system theory research such the dual-attitudes model (Wilson, Lindsey, & Schooler, 2000), reflective–impulsive model (Strack & Deutsch, 2004; Hofmann, Friese, & Strack, 2009), hot–cool system (Metcalfe and Mischel, 1999), cognitive-experiential self-theory (Epstein & Morling, 1995), and research on fast/system 1 versus slow/system 2 processes (Kahneman & Egan, 2011).

In summary, the present thesis demonstrates that the presentation of academic study elucidates diminished self-control in individuals low in implicit self-esteem, in comparison with the presentation of social media. In contrast, the presentation of social media elucidates diminished self-control in individuals high in implicit self-esteem, in comparison with the presentation of academic study. The current study explains these findings as a result of an individual's motivation to approach goals that affirm the self, and to avoid goals that promote conflict. These results may provide an account of why LSE individuals have a proclivity to seek social reinforcement from tools such as online social networks. This extends previous literature on self-esteem and self-control, with the intent of building on research being conducted at the intersection between social psychology and cyber-psychology.

5 References

Aarts, H., & Dijksterhuis, A. (2000). Habits as knowledge structures: Automaticity in goal-directed behavior. *Journal of Personality and Social Psychology*, *78*(1), 53. http://doi.org/10.1037/0022-3514.78.1.53

Ainslie, G. (1986). Beyond microeconomics: Conflict among interests in a multiple self as a determinant of value. *The Multiple Self*, 133-175. Cambridge: London. Retrieved from http://www.picoeconomics.org/Articles/BeyondMicro86.pdf

Atchley, P., & Warden, A. C. (2012). The need of young adults to text now: Using delay discounting to assess informational choice. *Journal of Applied Research in Memory and Cognition*, *1*(4), 229-234. http://doi.org/10.1016/j.jarmac.2012.09.001

Austin, J. T., & Vancouver, J. B. (1996). Goal constructs in psychology: Structure, process, and content. *Psychological Bulletin, 120*(3), 338-375. http://dx.doi.org.ezproxy.canterbury.ac.nz/10.1037/0033-2909.120.3.338

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28*(2), 117-148. https://doi.org/10.1207/s15326985ep2802_3

Barkley, R. A. (2001). The executive functions and self-regulation: An evolutionary neuropsychological perspective. *Neuropsychology Review*, *11*(1), 1-29. https://doi.org/10.1023/A:1009085417776

Baron, S. W. (2003). Self-control, social consequences, and criminal behavior: Street youth and the general theory of crime. *Journal of Research in Crime and Delinquency*, *40*(4), 403-425. https://doi.org/10.1177/0022427803256071

Barrett, L. F., Tugade, M. M., & Engle, R. W. (2004). Individual differences in working memory capacity and dual-process theories of the mind. *Psychological Bulletin, 130*(4), 553. http://doi.org/10.1037/0033-2909.130.4.553

Baumeister, R. F. (1998). The self. In D. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *Handbook of Social Psychology* (4th ed., pp. 680-740). Boston: McGraw-Hill. Retrieved from https://psy.fsu.edu/~baumeisterticelab/Baumeister%20%281998%29%20The%20Self%20chp15.pdf

Baumeister, R. F. (2014). Self-regulation, ego depletion, and inhibition. *Neuropsychologia, 65*, 313-319. https://doi.org/10.1016/j.neuropsychologia.2014.08.012

Baumeister, R. F., Bushman, B. J., & Campbell, W. K. (2000). Self-esteem, narcissism, and aggression: Does violence result from low self-esteem or from threatened egotism? *Current Directions in Psychological Science, 9*(1), 26-29. https://doi.org/10.1111/1467-8721.00053

Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, K. D. (2003). Does high self-esteem cause better performance, interpersonal success, happiness, or healthier

lifestyles? *Psychological Science in the Public Interest, 4*(1), 1-44. https://doi.org/10.1111/1529-1006.01431

Baumeister, R. F., & Heatherton, T. F. (1996). Self-regulation failure: An overview. *Psychological Inquiry, 7*(1), 1-15. https://doi.org/10.1207/s15327965pli0701_1

Baumeister, R. F., Heatherton, T. F., & Tice, D. M. (1993). When ego threats lead to self-regulation failure: Negative consequences of high self-esteem. *Journal of Personality and Social Psychology, 64*(1), 141-156. https://doi.org/10.1037/0022-3514.64.1.141

Baumeister, R. F., Heatherton, T. F., & Tice, D. M. (1994). Losing control: How and why people fail at self-regulation. San Diego, CA: Academic press.

Baumeister, R. F., Tice, D. M., & Hutton, D. G. (1989). Self-presentational motivations and personality differences in self-esteem. *Journal of Personality, 57*(3), 547-579. https://doi.org/10.1111/j.1467-6494.1989.tb02384.x

Baumeister, R. F., & Vohs, K. D. (2007). Self-regulation, ego depletion, and motivation. *Social and Personality Psychology Compass, 1*(1), 115-128. https://doi.org/10.1111/j.1751-9004.2007.00001.x

Berger, J., & Buechel, E. (2012). Facebook therapy? Why people share self-relevant content online. In Z. Gurnham-Canli, C. Otnes, & R. Duluth (Eds.), *Advances in Consumer Research*, (Vol. 40, pp. 203-208). http://dx.doi.org/10.2139/ssrn.2013148

Bernoulli, D. (1954). Exposition of a new theory on the measurement of risk. *Econometrica, 22*(1), 23-36. https://doi.org/10.1142/9789814293501_0002

Blascovich, J. (2013). Chapter 25: Challenge and Threat Appraisal. In A. J. Elliot (Ed), *Handbook of Approach and Avoidance Motivation* (pp. 432-444). Retrieved from https://books.google.co.nz

Boninger, D. S., Krosnick, J. A., & Berent, M. K. (1995). Origins of attitude importance: self-interest, social identification, and value relevance. *Journal of Personality and Social Psychology, 68*(1), 61-80. http://dx.doi.org/10.1037/0022-3514.68.1.61

Bosson, J. K., Swann Jr, W. B., & Pennebaker, J. W. (2000). Stalking the perfect measure of implicit self-esteem: The blind men and the elephant revisited? *Journal of Personality and Social Psychology, 79*(4), 631-643. https://doi.org/10.1037//0022-3514.79.4.631

Boyd, D. M., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication, 13*(1), 210-230. https://doi.org/10.1111/j.1083-6101.2007.00393.x

Brown, J. D., & Dutton, K. A. (1995). The thrill of victory, the complexity of defeat: Self-esteem and people's emotional reactions to success and failure. *Journal of Personality and Social Psychology, 68*(4), 712.

Brown, J. D., Dutton, K. A., & Cook, K. E. (2001). From the top down: Self-esteem and self-evaluation. *Cognition & Emotion, 15*(5), 615-631. https://doi.org/10.1080/02699930126063

Brown, J. D., & Marshall, M. A. (2006). The three faces of self-esteem. In M. Kernis (Ed.), *Self-esteem: Issues and Answers* (pp. 4-9). New York: Psychology Press. Retrieved from https://faculty.washington.edu/jdb/448/448articles/kernis.pdf

Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: the BIS/BAS scales. *Journal of Personality and Social Psychology, 67*(2), 319.

Crocker, J., & Park, L. E. (2004). The costly pursuit of self-esteem. *Psychological Bulletin, 130*(3), 392-414. http://dx.doi.org/10.1037/0033-2909.130.3.392

Crocker, J., & Wolfe, C. T. (2001). Contingencies of self-worth. *Psychological Review, 108*(3), 593-623. https://doi.org/10.1037//0033-295X.108.3.593

Csikszentmihalyi, M., & Csikszentmihalyi, I. (1975). Beyond Boredom and Anxiety: Experiencing Flow in Work and Play, 721. San Francisco: Jossey-Bass. Retrieved from http://psycnet.apa.org/record/2000-12701-000

Dentale, F., Vecchione, M., & Barbaranelli, C. (2016). Applying the IAT to assess Big Five personality traits: A brief review of measurement and validity issues. *Psychology and Mental Health: Concepts, Methodologies, Tools, and Applications*, 113-127. https://doi.org/10.4018/978-1-5225-0159-6.ch005

Duckworth, A. L., & Seligman, M. E. (2005). Self-discipline outdoes IQ in predicting academic performance of adolescents. *Psychological Science, 16*(12), 939-944. Retrieved from https://www.jstor.org/stable/40064361

Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist, 34*(3), 169-189. https://doi.org/10.1207/s15326985ep3403_3

Epstein, S., & Morling, B. (1995). Is the self motivated to do more than enhance and/or verify itself? *Efficacy, Agency, and Self-Esteem*, 9-29. Boston, MA: Springer. Retrieved from https://books.google.co.nz

Facebook Reports Second Quarter 2018 Results (2018, July 25). Retrieved from https://www.prnewswire.com/news-releases/facebook-reports-second-quarter-2018-results-300686623.html

Farnham, S. D., Greenwald, A. G., & Banaji, M. R. (1999). Implicit self-esteem. In D. Abrams & M. A. Hogg (Eds.), *Social Identity and Social Cognition*, (pp. 230-248). Malden: Blackwell Publishing. Retrieved from http://psycnet.apa.org/record/1999-02213-009

Ferrari, J. R. (1991). Self-handicapping by procrastinators: Protecting self-esteem, social-esteem, or both? *Journal of Research in Personality, 25*(3), 245-261. https://doi.org/10.1016/0092-6566(91)90018-L

Ferrari, J. R. (1994). Dysfunctional procrastination and its relationship with self-esteem, interpersonal dependency, and self-defeating behaviors. *Personality and Individual Differences, 17*(5), 673-679. https://doi.org/10.1016/0191-8869(94)90140-6

Ferrari, J. R., & Tice, D. M. (2000). Procrastination as a self-handicap for men and women: A task-avoidance strategy in a laboratory setting. *Journal of Research in Personality, 34*(1), 73-83. https://doi.org/10.1006/jrpe.1999.2261

Fillmore, M. T. (2003). Drug abuse as a problem of impaired control: current approaches and findings. *Behavioral and Cognitive Neuroscience Reviews, 2*(3), 179-197. https://doi.org/10.1177/1534582303257007

Fishbach, A., Friedman, R. S., & Kruglanski, A. W. (2003). Leading us not into temptation: Momentary allurements elicit overriding goal activation. *Journal of Personality and Social Psychology, 84*(2), 296-309. https://doi.org/10.1037/0022-3514.84.2.296

Gardner, D. G., & Pierce, J. L. (1998). Self-esteem and self-efficacy within the organizational context: An empirical examination. *Group & Organization Management, 23*(1), 48-70. https://doi.org/10.1177/1059601198231004

Ge, Y., Huo, J. Y., & Wenger, J. L. (2018). Evaluating implicit emotions of Chinese university students with different levels of social adjustment: implicit measurement based on the go/no-go association task. *Psychological Reports*, 1-17. https://10.1177/0033294118776928

Gentile, B., Twenge, J. M., Freeman, E. C., & Campbell, W. K. (2012). The effect of social networking websites on positive self-views: An experimental investigation. *Computers in Human Behavior, 28*(5), 1929-1933. https://doi.org/10.1016/j.chb.2012.05.012

Gonzales, A. L., & Hancock, J. T. (2011). Mirror, mirror on my Facebook wall: Effects of exposure to Facebook on self-esteem. *Cyberpsychology, Behavior, and Social Networking, 14*(1-2), 79-83. https://doi.org/10.1089/cyber.2009.0411

Gottfredson, M. R., & Hirschi, T. (1990). A General Theory of Crime. Stanford, CA: Stanford University Press. Retrieved from http://psycnet.apa.org/record/1990-97753-000

Gray-Little, B., Williams, V. S., & Hancock, T. D. (1997). An item response theory analysis of the Rosenberg Self-Esteem Scale. *Personality and Social Psychology Bulletin, 23*(5), 443-451. https://doi.org/10.1177/0146167297235001

Greenberg, J., Solomon, S., Pyszczynski, T., Rosenblatt, A., Burling, J., Lyon, D., Simon, L., & Pinel, E. (1992). Why do people need self-esteem? Converging evidence that self-esteem serves an anxiety-buffering function. *Journal of Personality and Social Psychology, 63*(6), 913-922. http://doi.org/10.1037/0022-3514.63.6.913

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: attitudes, self-esteem, and stereotypes. *Psychological Review, 102*(1), 4-27. http://doi.org/10.1037/0033-295X.102.1.4

Greenwald, A. G., & Farnham, S. D. (2000). Using the implicit association test to measure self-esteem and self-concept. *Journal of Personality and Social Psychology, 79*(6), 1022-1038. https://doi/org/10.1037/0022-3514.79.6.1022

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. (1998). Measuring individual differences in implicit cognition: the implicit association test. *Journal of Personality and Social Psychology, 74*(6), 1464-1480. https://doi.org/10.1037/0022-3514.74.6.1464

Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the implicit association test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology, 85*(2), 197-216. https://doi.org/10.1037/0022-3514.85.2.197

Grellhesl, M., & Punyanunt-Carter, N. M. (2012). Using the uses and gratifications theory to understand gratifications sought through text messaging practices of male and female undergraduate students. *Computers in Human Behavior, 28*(6), 2175-2181. https://doi.org/10.1016/j.chb.2012.06.024

Hassell, M., & Sukalich, M. (2016). A deeper look into the complex relationship between social media use and academic outcomes and attitudes. *Information Research, 21*(4), 1-13. Retrieved from https://epublications.marquette.edu/cgi/viewcontent.cgi?article=1272&context=mgmt_fac

Hayes, A. F. (2017). Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach, (Vol. 2). New York: Guilford.

Heatherton, T. F., & Polivy, J. (1991). Development and validation of a scale for measuring state self-esteem. *Journal of Personality and Social psychology, 60*(6), 895. https://doi.org/10.1037/0022-3514.60.6.895

Heatherton, T. F., & Vohs, K. D. (2000). Interpersonal evaluations following threats to self: Role of self-esteem. *Journal of Personality and Social Psychology, 78*(4), 725-736. https://doi.org/10.1037/0022-3514.78.4.725

Hilgard, E. R. (1962). Impulsive versus realistic thinking: An examination of the distinction between primary and secondary processes in thought. *Psychological Bulletin, 59*(6), 477-488. https://doi.org/10.1037/h0042630

Hoch, S. J., & Loewenstein, G. F. (1991). Time-inconsistent preferences and consumer self-control. *Journal of Consumer Research, 17*(4), 492-507. https://doi.org/10.1086/208573

Hofmann, W., Friese, M., & Strack, F. (2009). Impulse and self-control from a dual-systems perspective. *Perspectives on Psychological Science, 4*(2), 162-176. https://doi.org/10.1111/j.1745-6924.2009.01116.x

Hofmann, W., Reinecke, L., & Meier, A. (2016). Of sweet temptations and bitter aftertaste: Self-control as a moderator of the effects of media use on well-being. In L. Reinecke & M. B. Oliver (Eds.), *The Routledge Handbook of Media Use and Well-Being: International Perspectives on Theory and Research on Positive Media Effects* (pp. 211-222). New York: Routledge. Retrieved from https://www.researchgate.net/profile/Adrian_Meier/publication/304525347_Of_sweet_te

mptations_and_bitter_aftertaste_Self_control_as_a_moderator_of_the_effects_of_media_use_on_well-being/links/596e05874585152dd4ab57ac/Of-sweet-temptations-and-bitter-aftertaste-Self-control-as-a-moderator-of-the-effects-of-media-use-on-well-being.pdf

Houben, K., & Wiers, R. W. (2009). Response inhibition moderates the relationship between implicit associations and drinking behavior. *Alcoholism: Clinical and Experimental Research, 33*(4), 626-633. https://doi.org/10.1111/j.1530-0277.2008.00877.x

Hughes, D. J., Rowe, M., Batey, M., & Lee, A. (2012). A tale of two sites: Twitter vs. Facebook and the personality predictors of social media usage. *Computers in Human Behavior, 28*(2), 561-569. https://doi.org/10.1016/j.chb.2011.11.001

Millisecond [Computer Software] (2016). Inquisit 5.0.4. Retrieved from http://www.millisecond.com

Jordan, C. H., Spencer, S. J., Zanna, M. P., Hoshino-Browne, E., & Correll, J. (2003). Secure and defensive high self-esteem. *Journal of Personality and Social Psychology, 85*(5), 969. https://doi.org/10.1037/0022-3514.85.5.969

Josephs, R. A., Larrick, R. P., Steele, C. M., & Nisbett, R. E. (1992). Protecting the self from the negative consequences of risky decisions. *Journal of Personality and Social Psychology, 62*(1), 26. https://doi.org/10.1037/0022-3514.62.1.26

Kahneman, D., & Egan, P. (2011). Thinking, Fast and Slow (Vol. 1). New York: Farrar, Straus and Giroux.

Katz, E., Blumler, J. G., & Gurevitch, M. (1973). Uses and gratifications research. *The Public Opinion Quarterly, 37*(4), 509-523. Retrieved from https://www.jstor.org/stable/2747854?seq=1#metadata_info_tab_contents

Kernis, M. H. (2003). Toward a conceptualization of optimal self-esteem. *Psychological Inquiry, 14*(1), 1-26. https://doi.org/10.1207/S15327965PLI1401_01

Kernis, M. H., Brockner, J., & Frankel, B. S. (1989). Self-esteem and reactions to failure: The mediating role of overgeneralization. *Journal of Personality and Social Psychology, 57* (4), 707. https://doi.org/10.1037/0022-3514.57.4.707

Kirschner, P. A., & Karpinski, A. C. (2010). Facebook® and academic performance. *Computers in Human Behavior, 26*(6), 1237-1245. https://doi.org/10.1016/j.chb.2010.03.024

Kuijer, R. (2016). Health Psychology [PowerPoint slides]. Retrieved from http:/www.learn.canterbury.ac.nz/

LaRose, R., Lin, C. A., & Eastin, M. S. (2003). Unregulated Internet usage: Addiction, habit, or deficient self-regulation? *Media Psychology, 5*(3), 225-253. https://doi.org/10.1207/S1532785XMEP0503_01

Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist, 57*(9), 705-717. https://doi.org/10.1037/0003-066X.57.9.705

Locke, E. A., Shaw, K. N., Saari, L. M., & Latham, G. P. (1981). Goal setting and task performance: 1969–1980. *Psychological Bulletin, 90(*1), 125-152. https://doi.org/10.1037/0033-2909.90.1.125

Markus, H., & Wurf, E. (1987). The dynamic self-concept: A social psychological perspective. *Annual Review of Psychology, 38*(1), 299-337. http://doi.org/10.1146/annurev.ps.38.020187.001503

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review, 50*(4), 370-396. https://doi.org/10.1037/h0054346

Maslow, A. H. (1954). Motivation and Personality. New York: Harper and Row.

Maslow, A. H., Frager, R., Fadiman, J., McReynolds, C., & Cox, R. (1970). Motivation and Personality (Vol. 2).

McLeod, S. A. (2018, May 21). Maslow's Hierarchy of Needs. Retrieved from https://www.simplypsychology.org/maslow.html

Meier, A., Reinecke, L., & Meltzer, C. E. (2016). Facebocrastination? Predictors of using Facebook for procrastination and its effects on students' well-being. *Computers in Human Behavior, 64*, 65-76. https://doi.org/10.1016/j.chb.2016.06.011

Metalsky, G. I., Halberstadt, L. J., & Abramson, L. Y. (1987). Vulnerability to depressive mood reactions: Toward a more powerful test of the diathesis–stress and causal mediation components of the reformulated theory of depression. *Journal of Personality and Social Psychology, 52*(2), 386. http://doi.org/10.1037/0022-3514.52.2.386

Metcalfe, J., & Mischel, W. (1999). A hot/cool-system analysis of delay of gratification: dynamics of willpower. *Psychological Review, 106*(1), 3-19. https://doi.org/10.1037/0033-295X.106.1.3

Mischel, W. (1974). Processes in delay of gratification. *Advances in Experimental Social Psychology, 7*, 249-292. Academic Press. https://doi.org/10.1016/S0065-2601(08)60039-8

Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., Houts, R., Poulton, R., Roberts, B.W., Ross, S. and Sears, (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences, 108*(7), 2693-2698. https://doi.org/10.1073/pnas.1010076108

Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin, 126*(2), 247-259. http://dx.doi.org/10.1037/0033-2909.126.2.247

Muraven, M., Tice, D. M., & Baumeister, R. F. (1998). Self-control as a limited resource: Regulatory depletion patterns. *Journal of Personality and Social Psychology, 74*(3), 774-789. https://doi.org/10.1037/0022-3514.74.3.774

Nabi, R. L., Prestin, A., & So, J. (2013). Facebook friends with (health) benefits? Exploring social network site use and perceptions of social support, stress, and well-being. *Cyberpsychology, Behavior, and Social Networking, 16*(10), 721-727. http://10.1089/cyber.2012.0521

Nakamura, J., & Csikszentmihalyi, M. (2009). Flow theory and research. In S. J. Lopez & C. R. Snyder (Eds.), *Oxford Library of Psychology: Oxford Handbook of Positive Psychology,* (pp. 195-206). New York, NY, US: Oxford University Press.

Nalwa, K., & Anand, A. P. (2003). Internet addiction in students: A cause of concern. *CyberPsychology & Behavior, 6*(6), 653-656. https://doi.org/10.1089/109493103322725441

Oberst, U., Wegmann, E., Stodt, B., Brand, M., & Chamarro, A. (2017). Negative consequences from heavy social networking in adolescents: The mediating role of fear of missing out. *Journal of Adolescence, 55,* 51-60. https://doi.org/10.1016/j.adolescence.2016.12.008

Oyserman, D., Elmore, K., & Smith, G. (2012). Self, self-concept, and identity. In M. R. Leary & J. P. Tangney (Eds.), *Handbook of Self and Identity* (pp. 69-104). New York, NY, US: Guilford Press.

Psychology Software Tools, Pittsburgh, PA. [E-Prime 3.0]. (2016). Retrieved from http://www.pstnet.com.

Qualtrics Research Suite software (2014). [Version 57,005]. Provo, UT, USA.

Reinecke, L., Tamborini, R., Grizzard, M., Lewis, R., Eden, A., & David Bowman, N. (2012). Characterizing mood management as need satisfaction: The effects of intrinsic needs on selective exposure and mood repair. *Journal of Communication, 62*(3), 437-453. http://doi.org/10.1111/j.1460-2466.2012.01649.x

Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Construct validation of a single-item measure and the Rosenberg Self-Esteem Scale. *Personality and Social Psychology Bulletin, 27*(2), 151-161. http://doi.org/10.1177/0146167201272002

Rosen, L. D., Carrier, L. M., & Cheever, N. A. (2013). Facebook and texting made me do it: Media-induced task-switching while studying. *Computers in Human Behavior, 29*(3), 948-958. https://doi.org/10.1016/j.chb.2012.12.001

Rosenberg, M. (1965). *Society and the Adolescent Self-Image.* Princeton, NJ: Princeton University Press.

Ross, L., & Nisbett, R. E. (2011). *The Person and the Situation: Perspectives of Social Psychology.* Great Britain: Pinter & Martin Publishers.

Sagioglou, C., & Greitemeyer, T. (2014). Facebook's emotional consequences: Why Facebook causes a decrease in mood and why people still use it. *Computers in Human Behavior, 35*, 359-363. https://doi.org/10.1016/j.chb.2014.03.003

Schacter, D., Gilbert, D., Wegner, D., & Hood, B. (2015). *Psychology: Second European Edition*. London: Palgrave Macmillan.

Schelling, T. C. (1978). Egonomics, or the art of self-management. *The American Economic Review, 68*(2), 290-294. Retrieved from https://www.jstor.org/stable/pdf/1816707.pdf

Schmitt, D. P., & Allik, J. (2005). Simultaneous administration of the Rosenberg Self-Esteem Scale in 53 nations: exploring the universal and culture-specific features of global self-esteem. *Journal of Personality and Social Psychology, 89*(4), 623-642. http://dx.doi.org/10.1037/0022-3514.89.4.623

Shah, J. Y., Friedman, R., & Kruglanski, A. W. (2002). Forgetting all else: on the antecedents and consequences of goal shielding. *Journal of Personality and Social Psychology, 83*(6), 1261.http://doi.org/10.1037/0022-3514.83.6.1261

Shah, J. Y., & Kruglanski, A. W. (2000). Aspects of goal networks: Implications for self-regulation. *Handbook of Self-Regulation*, 85-110. https://doi.org/10.1016/B978-012109890-2/50033-0

Sherman, D. K., & Cohen, G. L. (2006). The psychology of self-defense: Self-affirmation theory. *Advances in Experimental Social Psychology, 38*, 183-242. https://doi.org/10.1016/S0065-2601(06)38004-5

Simmonds, D. J., Pekar, J. J., & Mostofsky, S. H. (2008). Meta-analysis of Go/No-go tasks demonstrating that fMRI activation associated with response inhibition is task-dependent. *Neuropsychologia, 46*(1), 224-232. https://doi.org/10.1016/j.neuropsychologia.2007.07.015

Slocum Jr, J. W., Cron, W. L., & Brown, S. P. (2002). The effect of goal conflict on performance. *Journal of Leadership & Organizational Studies, 9*(1), 77-89. http://doi.org/10.1177/107179190200900106

Spalding, L. R., & Hardin, C. D. (1999). Unconscious unease and self-handicapping: Behavioral consequences of individual differences in implicit and explicit self-esteem. *Psychological Science*, *10*(6), 535-539. https://doi.org/10.1111/1467-9280.00202

Spencer, S. J., Josephs, R. A., & Steele, C. M. (1993). Low self-esteem: The uphill struggle for self-integrity. In *Self-Esteem* (pp. 21-36). Springer, Boston, MA. https://doi.org/10.1007/978-1-4684-8956-9_2

Statista (2018, July). Global Digital Population as of July 2018. Retrieved from https://www.statista.com/statistics/617136/digital-population-worldwide/

Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology: Social*

Psychological Studies of the Self: Perspectives and Programs, (Vol. 21, pp. 261–302). https://doi.org/10.1016/S0065-2601(08)60229-4

Steele, C. M., Spencer, S. J., & Lynch, M. (1993). Self-image resilience and dissonance: The role of affirmational resources. *Journal of Personality and Social Psychology, 64*(6), 885-896. https://doi.org/10.1037/0022-3514.64.6.885

Steinfield, C., Ellison, N. B., & Lampe, C. (2008). Social capital, self-esteem, and use of online social network sites: A longitudinal analysis. *Journal of Applied Developmental Psychology, 29*(6), 434-445. https://doi.org/10.1016/j.appdev.2008.07.002

Strack, F., & Deutsch, R. (2004). Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review, 8*(3), 220-247. https://doi.org/10.1207/s15327957pspr0803_1

Sullivan, H. S. (1953). The Interpersonal Theory of Psychiatry: Beginnings of the self-system. *Journal of Consulting Psychology, 17*(5), 401-413.

Sumter, S. R., Vandenbosch, L., & Ligtenberg, L. (2017). Love me Tinder: Untangling emerging adults' motivations for using the dating application Tinder. T*elematics and Informatics, 34*(1), 67-78. https://doi.org/10.1016/j.tele.2016.04.009

Tangney, J.P., Baumeister, R.F., & Boone, A.L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality, 72*, 271–324. https://doi.org/10.1111/j.0022-3506.2004.00263.x

Tesser, A. (2000). On the confluence of self-esteem maintenance mechanisms. *Personality and Social Psychology Review, 4*(4), 290-299. https://doi.org/10.1207/S15327957PSPR0404_1

The Two Systems of Cognitive Processes (2012, January 16). Retrieved from https://bigthink.com/delancey-place/the-two-systems-of-cognitive-processes

Tice, D. M., & Bratslavsky, E. (2000). Giving in to feel good: The place of emotion regulation in the context of general self-control. *Psychological Inquiry, 11*(3), 149-159. Retrieved from https://www.jstor.org/stable/pdf/1449793.pdf

Tice, D. M., Bratslavsky, E., & Baumeister, R. F. (2001). Emotional distress regulation takes precedence over impulse control: If you feel bad, do it! *Journal of Personality and Social Psychology, 80*(1), 53-67. https://doi.org/10.1037//0022-3514.80.1.53

Toma, C. L. (2013). Feeling better but doing worse: Effects of Facebook self-presentation on implicit self-esteem and cognitive task performance. *Media Psychology, 16*(2), 199-220. https://doi.org/10.1080/15213269.2012.762189

Valkenburg, P. M., Peter, J., & Schouten, A. P. (2006). Friend networking sites and their relationship to adolescents' well-being and social self-esteem. *CyberPsychology & Behavior, 9*(5), 584-590. http://doi.org/10.1089/cpb.2006.9.584

Vogel, E. A., Rose, J. P., Roberts, L. R., & Eckles, K. (2014). Social comparison, social media, and self-esteem. *Psychology of Popular Media Culture, 3*(4), 206-222. http://dx.doi.org/10.1037/ppm0000047

Vohs, K. D., Baumeister, R. F., Schmeichel, B. J., Twenge, J. M., Nelson, N. M., & Tice, D. M. (2008). Making choices impairs subsequent self-control: A limited-resource account of decision making, self-regulation, and active initiative. *Journal of Personality and Social Psychology, 94*(5), 883-898. https://doi.org/10.1037/0022-3514.94.5.883

Vohs, K. D., & Heatherton, T. F. (2001). Self-esteem and threats to self: Implications for self-construals and interpersonal perceptions. *Journal of Personality and Social Psychology, 81*(6), 1103-1118. https://doi.org/10.1037/0022-3514.81.6.1103

Weiser, E. B. (2001). The functions of Internet use and their social and psychological consequences. *CyberPsychology & Behavior, 4*(6), 723-743. https://doi.org/10.1089/109493101753376678

Wilcox, K., & Stephen, A. T. (2012). Are close friends the enemy? Online social networks, self-esteem, and self-control. *Journal of Consumer Research, 40*(1), 90-103. https://doi.org/10.1086/668794

Wilmer, H. H., & Chein, J. M. (2016). Mobile technology habits: patterns of association among device usage, intertemporal preference, impulse control, and reward sensitivity. *Psychonomic Bulletin & Review, 23*(5), 1607-1614. https://doi.org/10.3758/s13423-016-1011-z

Wilson, T. D., Lindsey, S., & Schooler, T. Y. (2000). A model of dual attitudes. *Psychological Review, 107*(1), 101. https://doi.org/10.1037/0033-295X.107.1.101

Wolfe, C., & Crocker, J. (2003). What does the self want? Contingencies of self-worth and goals. In S. J. Spencer, S. Fein, M. P. Zanna, & J. M. Olson (Eds.), *Motivated Social Perception: The Ontario Symposium* (Vol. 9, pp. 147-170). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.

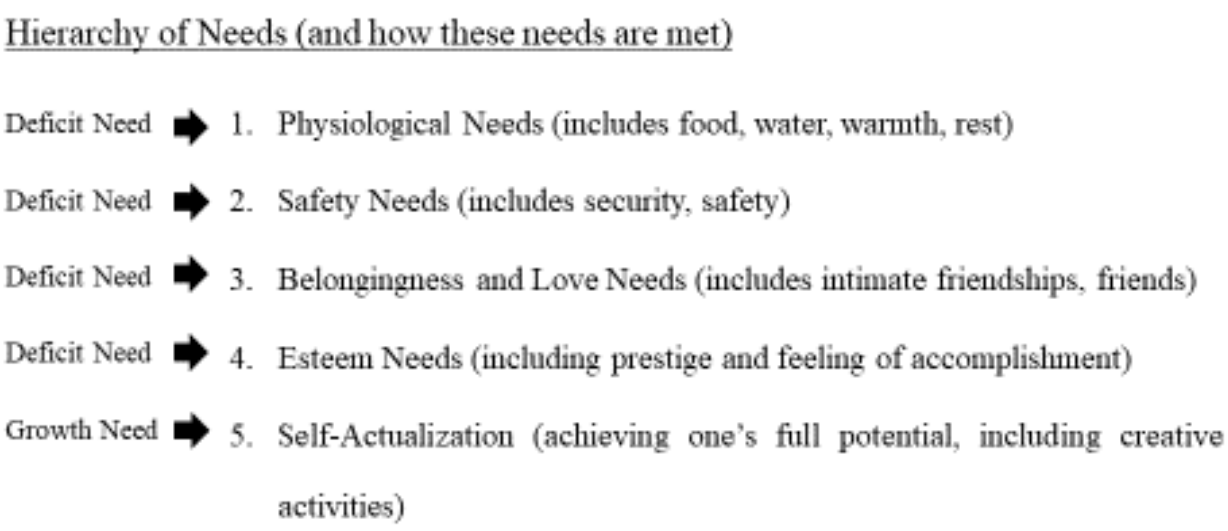
Wright, B. R. E., Caspi, A., Moffitt, T. E., & Silva, P. A. (1999). Low self-control, social bonds, and crime: Social causation, social selection, or both? *Criminology, 37*(3), 479-514. https://doi.org/10.1111/j.1745-9125.1999.tb00494.x

Zenith Media (2017, May 30). 26% of media consumption will be mobile in 2019. Retrieved from https://www.zenithmedia.com/26-of-media-consumption-will-be-mobile-in-2019/

6 Appendices

Appendix A

Figure 1. Maslow's Hierarchy of Needs (1954)



(McLeod, 2017).

Appendix B

Figure 2. Demographic Measures

What is your gender?		
Male	Female	Other

Ethnicity (check all that apply)								
NZ European	Maori	Asian	Pacific Islander	African	Arab or Middle Eastern	South American	Other European	Other (please specify)

Nationality or Citizenship	
NZ Citizen	Other (please specify)

Is English your first language?	
Yes	No

What is your age?						
17-20	21 - 25	26 - 30	31 - 40	41 - 50	51 - 65	65+

Are you left or right handed?	
Right	Left

Think of this ladder as showing where people stand in their communities. People define community in different ways. Please define it in whatever way is most meaningful to you.

At the top of the ladder are the people who have the highest standing in their community. At the bottom are the people who have the lowest standing in their community.

Where would you place yourself on this ladder?

Choose the number that best describes where you think you stand at this time of your life relative to other people in your community.

10 – the top	9	8	7	6	5	4	3	2	1 – the bottom

Appendix C

Figure 3. The Rosenberg Self-Esteem Scale (Rosenberg, 1965)

SE1	I feel that I'm a person of worth, at least on an equal basis with others
SE2	I feel that I have a number of good qualities
SE3	All in all, I am inclined to feel that I am a failure
SE4	I am able to do things as well as most other people
SE5	I feel I do not have much to be proud of
SE6	I take a positive attitude toward myself
SE7	On the whole, I am satisfied with myself
SE8	I wish I could have more respect for myself
SE9	I certainly feel useless at times
SE10	At times I think I am no good at all

SE: Self-Esteem

Response options: 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree Nor Disagree, 4 = Agree, 5 = Strongly Agree.

Items 3, 5, 8, 9, 10 were all reverse coded.

Appendix D

Figure 4. The categorisation tasks in the IAT and examples of words used

Category Labels	Sample Items	Category Labels
Step 1: Practice block (20 trials)		
Other		Self
	me	●
●	them	
Step 2: Practice block (20 trials)		
Pleasant		Unpleasant
●	joy	
	filth	●
Step 3: Practice block (20 trials) Critical block (40 trials)		
Pleasant or Other		Unpleasant Or Self
	filth	●
●	joy	
●	them	
	me	●
Step 4: Practice block (20 trials)		
Self		Other
●	me	
	them	●
Step 5: Practice block (20 trials) Critical block (40 trials)		
Pleasant Or Self		Unpleasant Or Other
	them	●
●	joy	
	filth	●
●	me	

Appendix E

Figure 5. Trait Self-Control scale (Tangney, Baumeister, & Boone, 2004)

SC1	I have a hard time breaking bad habits
SC2	I am lazy.
SC3	I say inappropriate things.
SC4	I do certain things that are bad for me, if they are fun.
SC5	I refuse things that are bad for me.
SC6	I wish I had more self-discipline.
SC7	I never allow myself to lose control.
SC8	People would say that I have iron self-discipline.
SC9	I have trouble concentrating.
SC10	I am able to work effectively toward long-term goals.
SC11	Sometimes I can't stop myself from doing something, even if I know it's wrong.
SC12	I often act without thinking through all the alternatives.
SC13	Pleasure and fun sometimes keep me from getting work done.
SC14	People can count on me to keep on schedule.
SC15	Getting up in the morning is hard for me.
SC16	I have trouble saying no.
SC17	I change my mind fairly often.
SC18	I blurt out whatever is on my mind.
SC19	People would describe me as impulsive.
SC20	I spend too much money.
SC21	I keep everything neat.
SC22	I am self-indulgent at times.
SC23	I am reliable.
SC24	I get carried away by my feelings.
SC25	I do many things on the spur of the moment.
SC26	I don't keep secrets very well.
SC27	I have worked or studied all night at the last minute.
SC28	I'm not easily discouraged.
SC29	I'd be better off if I stopped to think before acting.
SC30	I engage in healthy practices.
SC31	I eat healthy foods.
SC32	I lose my temper too easily.
SC33	I often interrupt people.
SC34	I sometimes drink or use drugs to excess.
SC35	I am always on time.
SC36	I am not good at resisting temptation.

SC: Self-Control

Response options: 1 = very rarely, 2 = rarely, 3 = sometimes, 4 = often, 5 = very often.

Items 1, 2, 3, 4, 6, 9, 11, 12, 13, 15, 16, 17, 18, 19, 20, 22, 24, 25, 26, 27, 29, 32, 34, 36 were all reverse coded.

Appendix F

Figure 6. List of letters used in the Go/No-Go task and their respective uses

Distractor Stimuli	b, c, d, f, g, h, j, k, m, o, p
Prime stimuli	n
Go stimuli:	k
No-Go stimuli	b, c, d, f, g, h, j, m, o, p

Figure 7. Go/No-Go trial example for go trials

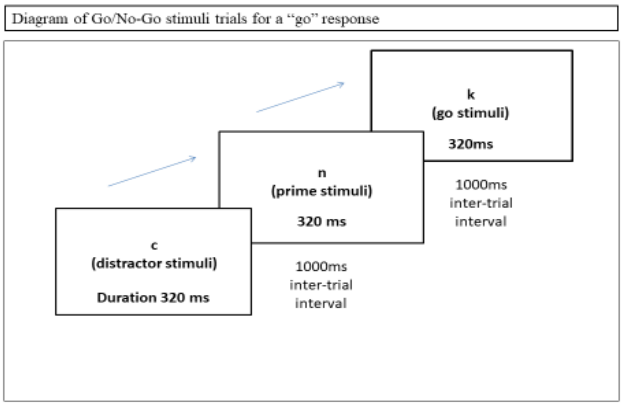
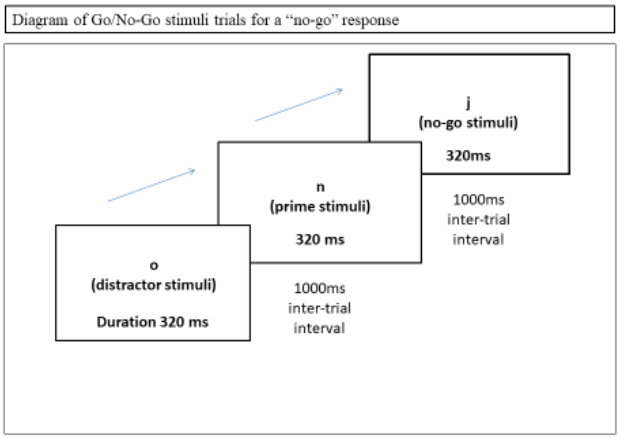


Figure 8. Go/No-Go task example for no-go trials



Appendix G

Human Ethics Committee Approval

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

HUMAN ETHICS COMMITTEE

Secretary, Rebecca Robinson
Telephone: +64 03 369 4588, Extn 94588
Email: human-ethics@canterbury.ac.nz

Ref: HEC 2017/104

9 October 2017

Matthew Johnston
Psychology
UNIVERSITY OF CANTERBURY

Dear Matthew

The Human Ethics Committee advises that your research proposal "Instant Gratification for the Internet Generation: How Goal Congruency Promotes Self-Control as a Function of Self-Esteem" has been considered and approved.

Please note that this approval is subject to the incorporation of the amendments you have provided in your email of 4th October 2017, **and the following**:

Approval from the HEC is subject to fulfilling any requirements Liz Brown may suggest. Please forward the communication from Liz to the HEC once received.

Best wishes for your project.

Yours sincerely

pp. R. Robinson

Associate Professor Jane Maidment
Chair
University of Canterbury Human Ethics Committee

Appendix H

Participant Information Sheet

(As copied from the online link accessed by participants)

Study Name: Internet, Personality and Behaviour study

Researchers:

Dr Kyle Nash, Department of Psychology, University of Canterbury

Dr Kumar Yogeeswaran, Department of Psychology, University of Canterbury

Matthew Johnston, Department of Psychology, University of Canterbury

Purpose of Research?

This ground-breaking research investigates patterns of relations among participants' personality dispositions and personal orientations, experiences, preferences, and thought processes. It will add to international researchers' growing understanding of how basic processes that underlie personality differences relate to important social phenomena.

What Will You Be Asked To Do?

In total, the study session will take 60 minutes to complete. There are multiple components of this study that are part of a larger subset. Several parts that you may be asked to complete are as follows:

a) Rate your personality on various questionnaires with items such as, "I am an active person"

b) Be asked demographic questions such as your age and gender.

c) Complete an exercise that requires you to focus for a period of 15 minutes with on-screen directions.

d) Participate in 2 individual cognitive tasks which you will be asked to complete to the best of your capabilities.

e) Report on your experience in participating in this study.

Risks and Discomforts:

There are no obvious risks of participation in this research, but some of the questions may be challenging or may require that you reflect on aspects of yourself or life that you may be uncomfortable with. You are free to decline to respond to any such materials.

Benefits of the Research and Benefits to You:

This research may benefit society by contributing to a better understanding of personality processes that underlie people's opinions, values, goals, preferences, and personalities, more generally. Ultimately, we hope that better scientific understanding of people's different orientations will contribute to improvements in policies designed to help societies function more optimally and with less conflict.

You may also derive personal benefit from participation in this research insofar as it may contribute to your having a more concrete understanding of the process of social science. Moreover, many of the questions involve self-reflection, and past participants have commented that they appreciated the opportunity to reflect on themselves and their lives.

Voluntary Participation:

Your participation in the study is completely voluntary. Whether you decide to volunteer, or not, will not influence your relation with the researchers involved in the study, or with the University of Canterbury, either now, or in the future.

Withdrawal from the Study:

You can stop participating, or skip question or sections in the study at any time, for any reason, if you so decide. If you decide to stop participating, or to skip certain parts, you will still be eligible to receive the points for agreeing to be in the project. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with the researchers, the University, or any other group associated with this project.

Confidentiality:

All information you supply during the research will be held in confidence and your name will not appear in any report or publication of the research. Only research staff will have access to the data, and your name or other identifying information (such as your student number or email address) will not be stored in the same file or location as the data.

Questions about the Research:

If you have questions about the research in general or about the role in the study, please feel free to contact Matthew Johnston (email matty.johnston@pg.canterbury.ac.nz). This research has been reviewed by the Human Ethics Committee of the University of Canterbury (HEC). If you have any questions about this process or about your rights as a participant in the study, please contact the Chair of The Human Ethics Committee of the University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

Appendix I

Participant Consent

(As copied from the online link accessed by participants)

PARTICIPANT CONSENT FORM

- I have read and understood the description of the above-mentioned project.
- I understand that my participation will involve completing a confidential questionnaire, if I agree to take part in the research.
- I understand that I am eligible for course credit (for PSYC105).
- I understand that participation is voluntary and I can withdraw from the study at any time.
- I understand the data I have provided will be deleted after 5 years.
- I agree to publication of results, with the understanding that any information or opinions I provide will be kept confidential. Also that any published or reported results will not identify my name or personal information.
- I agree to follow instructions provided by the experimenter in order to ensure my own safety.
- I understand that all data collected for the study will be kept in locked and secure facilities and will be destroyed after five years.
- I am satisfied with all the measures that will be taken to protect my identity and ensure that my interests are protected.
- I understand the risks associated with taking part and how they will be managed.
- I understand that I am able to receive a report on the findings of the study or further information by contacting the researcher at the conclusion of the project, Mr Matthew Johnston, matty.johnston@pg.canterbury.ac.nz.
- If I have any complaints, I can contact the Chair of The Human Ethics Committee of the University of Canterbury (HEC), Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)

By entering my initials below, I agree to participate in this research project and I indicate that I understand and agree to the research conditions.

... (Box for participants initials)…

Appendix J

Post-assessment self-report questionnaire for participants in social media condition

POST-EXPERIMENT SURVEY

1) Recall the task about **social media**. How well do you remember how you felt during that task?

2) Please rate the extent to which completing this task made you feel.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Good					
Bad					
Friendly					
Unfriendly					
Angry					
Pleasant					
Happy					
Sad					
Smart					
Successful					
Likeable					
Meaningful					
Frustrated					
Confused					
Uncertain					
Empty					
Anxious					
Ashamed					
Insecure					
Lonely					
Stupid					
Out of Control					

3) Thank you again for your time. You are now reaching the end of the research study. Before you leave, we would like to explain to you in further detail what the study was about and what we expected to find.

Do you think we were investigating something other than we claimed? If so, what?

4) Out of the 15 minutes spent during the social media condition, how many of those minutes would you say you spend focused on that task?

5) Please take this opportunity to tell us your experience of the **whole study**

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I found the instructions hard to understand					
I gave this study my undivided attention					
I sometimes just clicked random responses in order to get through this study as quickly as possible					
I found the study required a lot of self-control					
Overall, I found I was confident during the study					
Overall, I found I was anxious throughout the study					
I found myself daydreaming throughout the study					

Thank you for your time and effort!

Put up your hand and someone will help collect your details as reimbursement for your time.

Appendix K

Post-assessment self-report questionnaire for participants in academic study condition

POST-EXPERIMENT SURVEY

1) Recall the task where you performed **PSYC 105 study**. How well do you remember how you felt during that task?

2) Please rate the extent to which completing this task made you feel.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Good					
Bad					
Friendly					
Unfriendly					
Angry					
Pleasant					
Happy					
Sad					
Smart					
Successful					
Likeable					
Meaningful					
Frustrated					
Confused					
Uncertain					
Empty					
Anxious					
Ashamed					
Insecure					
Lonely					
Stupid					
Out of Control					

3) Thank you again for your time. You are now reaching the end of the research study. Before you leave, we would like to explain to you in further detail what the study was about and what we expected to find.

Do you think we were investigating something other than we claimed? If so, what?

4) Out of the 15 minutes spent during the PSYC 105 study condition, how many of those minutes would you say you spend focused on that task?

5) Please take this opportunity to tell us your experience of the **whole study**

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I found the instructions hard to understand					
I gave this study my undivided attention					
I sometimes just clicked random responses in order to get through this study as quickly as possible					
I found the study required a lot of self-control					
Overall, I found I was confident during the study					
Overall, I found I was anxious throughout the study					
I found myself daydreaming throughout the study					

Thank you for your time and effort!

Put up your hand and someone will help collect your details as reimbursement for your time.

Appendix L

Debriefing Form

College of Science

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

DEBRIEFING

Thank you very much for helping us with this research. Your efforts are very much appreciated. This page outlines the main questions that this research was designed to answer.
Past research in our lab has found that people react differently to stimuli that provide smaller rewards in the short-term, as opposed to larger rewards in the long-term. This is dependent upon differences in personality, and differences in the goals that individuals set and strive for. This current research investigates similar questions and also probes basic patterns of thinking in regards to how individuals classify particular stimuli as conflicting, or affirming to their personal goals.

You and the other participants may have participated in conditions that differ from one-another. What condition you participated in was selected at random. Some of you completed 15 minutes of personal study (aimed to provide delayed gratification, or satisfy long-term goals). Others of you completed 15 minutes of social media engagement (aimed to provide instant gratification, or satisfy short-term "impulsive" goals). In line with our past research and our hypothesis, we expected that some participants who completed the personal study condition would tend to find the study materials as challenging, whereas others may find it threatening. Ego threat may be associated with poorer performance on subsequent cognitive tasks (like the tasks you performed near the end of the study). This is proposed due to an internal conflict of personal goals, and the need for some individuals to gain rewards immediately in order to act as a buffering agent and satisfy the perception of ego depletion.

Moreover, we expected that only certain personality types would react to the research study condition as a potential ego threat. We actually hypothesised that other individuals' may view this task as more of a challenge, and something that promotes higher cognitive performance on subsequent tasks. This is why we asked you so many personality questions at the beginning of the study.

Finally, we were also interested in how some individuals performed on the cognitive tasks following participation in the social media condition. We did not expect this condition to threaten individuals' ego. However, dependent upon differences in personality, we anticipated that some individuals may find this condition as ego-boosting and rewarding. This is hypothesised to have positive effects on performance during the following cognitive tests. Therefore the results for your timed performance on the cognitive tasks will be compared with how you answered the initial personality questionnaires, and dependent upon the condition you were randomly selected to participate in.

We are sorry that we were not able to give you all these details up front, before you began the study. Doing so could have spoiled the study because some participants might have altered their responses based on their expectations. Accordingly, the study required some deception about some of the materials. All of you were either told that participation in the personal study condition or participation in the social media condition would help you dissociate from the tasks you had completed previous. This is not proven research! The real motive behind asking you to participate in these conditions was to provide two different environments in which we anticipated would either elicit a challenge or a threat to your personality resources, and as such would either result in an increase (or decrease) in cognitive capacity on the succeeding self-control tasks.

Of course, if completing any of these or other materials has raised personal issues which you find too distressing, the following contacts are provided for you below. Furthermore, if you have any issues with this study or the data collected, please use the contact details below.
If you wish to acquire a summary of the results of this research or you have a question about the research in general or about your role in the study, please feel free to contact Matthew Johnston (email: matty.johnston@pg.canterbury.ac.nz) or Dr. Kumar Yogeeswaran (phone: +64 3 364 2964 ext.6964).

This research has been reviewed by The Human Ethics Committee of the University of Canterbury (HEC). If you have any questions about this process or about your rights as a participant in the study, please contact the Chair of the Human Ethics Committee of the University of Canterbury, private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).
If completing any of the materials has raised personal issues which you find distressing, the following contacts are provided for your convenience:

- UC Health Centre counselling services, +64 3 364 2402 (confidential, professional counselling for UC students)
- Student Support and Services at +64 3 364 2350 or +64 3 364 2987
- Email studentdevelopment@canterbury.ac.nz (confidential peer counselling by UC students for UC students).

Thank you once again for your help with this important research.

Sincerely,

Matthew Johnston, and the rest of the research team.

Appendix M

Table 1. Conditional Effects of Social Media - Academic Study Manipulation at values of Implicit Self-Esteem (exclusionary dataset parameters 1 (N = 215))

IAT-D	Effect	se	t	p	LLCI	ULCI
-0.7935	-0.0640	0.0277	-2.3095	0.0126	-0.1187	-0.0094
-0.6626	-0.0578	0.0255	-2.2679	0.0134	-0.1080	-0.0075
-0.5317	-0.0515	0.0233	-2.2158	0.0145	-0.0974	-0.0057
-0.4009	-0.0453	0.0211	-2.1491	0.0162	-0.0868	-0.0037
-0.2700	-0.0390	0.0189	-2.0620	0.0188	-0.0763	-0.0017
-0.1391	-0.0340	0.0173	-1.9721	0.0230	-0.0681	0.0000
-0.0082	-0.0328	0.0168	-1.9452	0.0305	-0.0660	0.0005
0.1227	-0.0265	0.0148	-1.7844	0.0456	-0.0558	0.0028
0.1473	-0.0202	0.0130	-1.5580	0.0500	-0.0458	0.0054
0.2536	-0.0140	0.0113	-1.2340	0.0803	-0.0363	0.0084
0.3845	-0.0077	0.0100	-0.7749	0.1712	-0.0274	0.0119
0.5154	-0.0015	0.0090	-0.1618	0.4130	-0.0193	0.0163
0.6462	0.0048	0.0087	-0.5534	0.9030	-0.0123	0.0219
0.7771	0.0111	0.0089	1.2353	0.5504	-0.0066	0.0287
0.9080	0.0173	0.0098	1.7636	0.2320	-0.0020	0.0367
1.0389	0.0207	0.0105	1.9721	0.1047	0.0000	0.0413
1.1698	0.0236	0.0111	2.1167	0.0565	0.0016	0.0455
1.2016	0.0298	0.0128	2.3366	0.0500	0.0047	0.0550
1.3007	0.0361	0.0146	2.4711	0.0362	0.0073	0.0649
1.4316	0.0423	0.0166	2.5540	0.0264	0.0096	0.0750
1.5625	0.0486	0.0187	2.6059	0.0118	0.0118	0.0854
1.6933	0.0549	0.0208	2.6389	0.0139	0.0139	0.0959
1.8242	0.0611	0.0230	2.6603	0.0085	0.0158	0.1064

IAT-D: Implicit self-esteem scores

Effect: Effect of condition, centred around 0 (-1 = social media, +1 = academic study)

se: standard error

t: standardized test statistic, *t-score*

p: calculated probability, *p-value*

LLCI: lower limit confidence interval

UCLI: upper limit confidence interval

Appendix N

Table 2. Conditional Effects of Social Media - Academic Study Manipulation at values of Implicit Self-Esteem (exclusionary dataset parameters 2 (N = 205))

IAT-D	Effect	se	t	p	LLCI	ULCI
-0.7935	-0.0702	0.0279	-2.5185	0.0126	-0.1252	-0.0152
-0.6626	-0.0639	0.0256	-2.4953	0.0134	-0.1145	-0.0134
-0.5317	-0.0576	0.0234	-2.4650	0.0145	-0.1038	-0.0115
-0.4009	-0.0514	0.0212	-2.4246	0.0162	-0.0931	-0.0096
-0.2700	-0.0451	0.0190	-2.3693	0.0188	-0.0826	-0.0076
-0.1391	-0.0388	0.0169	-2.2916	0.0230	-0.0721	-0.0054
-0.0082	-0.0325	0.0149	-2.1791	0.0305	-0.0619	-0.0031
0.1227	-0.0262	0.0130	-2.0118	0.0456	-0.0519	-0.0005
0.1473	-0.0250	0.0127	-1.9718	0.0500	-0.0500	0.0000
0.2536	-0.0199	0.0113	-1.7577	0.0803	-0.0422	0.0024
0.3845	-0.0136	0.0099	-1.3731	0.1712	-0.0332	0.0059
0.5154	-0.0073	0.0089	-0.8203	0.4130	-0.0250	0.0103
0.6462	-0.0010	0.0085	-0.1221	0.9030	-0.0179	0.0158
0.7771	0.0052	0.0088	0.5982	0.5504	-0.0121	0.0226
0.9080	0.0115	0.0096	1.1988	0.2320	-0.0074	0.0305
1.0389	0.0178	0.0109	1.6297	0.1047	-0.0037	0.0394
1.1698	0.0241	0.0126	1.9181	0.0565	-0.0007	0.0489
1.2016	0.0256	0.0130	1.9718	0.0500	0.0000	0.0513
1.3007	0.0304	0.0144	2.1089	0.0362	0.0020	0.0588
1.4316	0.0367	0.0164	2.2370	0.0264	0.0044	0.0690
1.5625	0.0430	0.0185	2.3255	0.0210	0.0065	0.0794
1.6933	0.0493	0.0206	2.3884	0.0178	0.0086	0.0900
1.8242	0.0556	0.0228	2.4343	0.0158	0.0106	0.1006

IAT-D: Implicit self-esteem scores

Effect: Effect of condition, centred around 0 (-1 = social media, +1 = academic study)

se: standard error

t: standardized test statistic, *t-score*

p: calculated probability, *p-value*

LLCI: lower limit confidence interval

UCLI: upper limit confidence interval